

# The Mining Journal

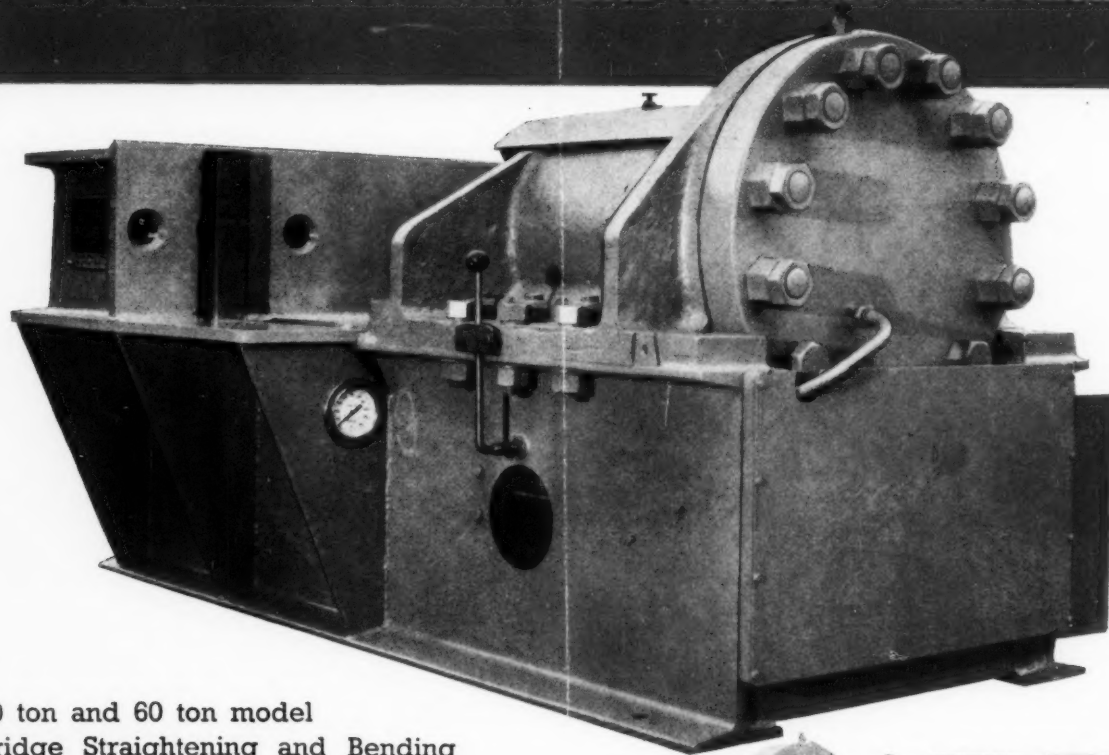
LONDON, MAY 23, 1958

Vol. 250. No. 6405.

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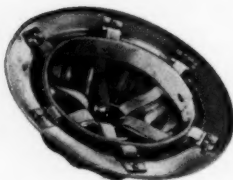
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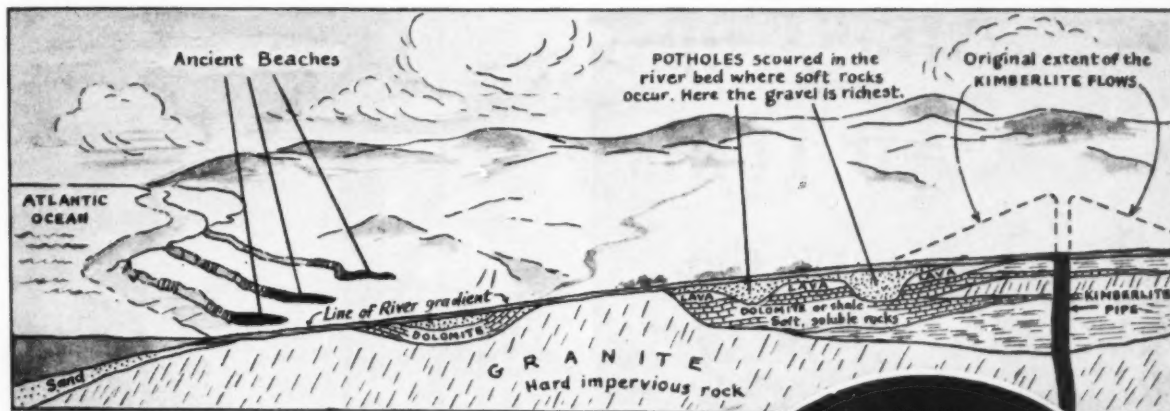


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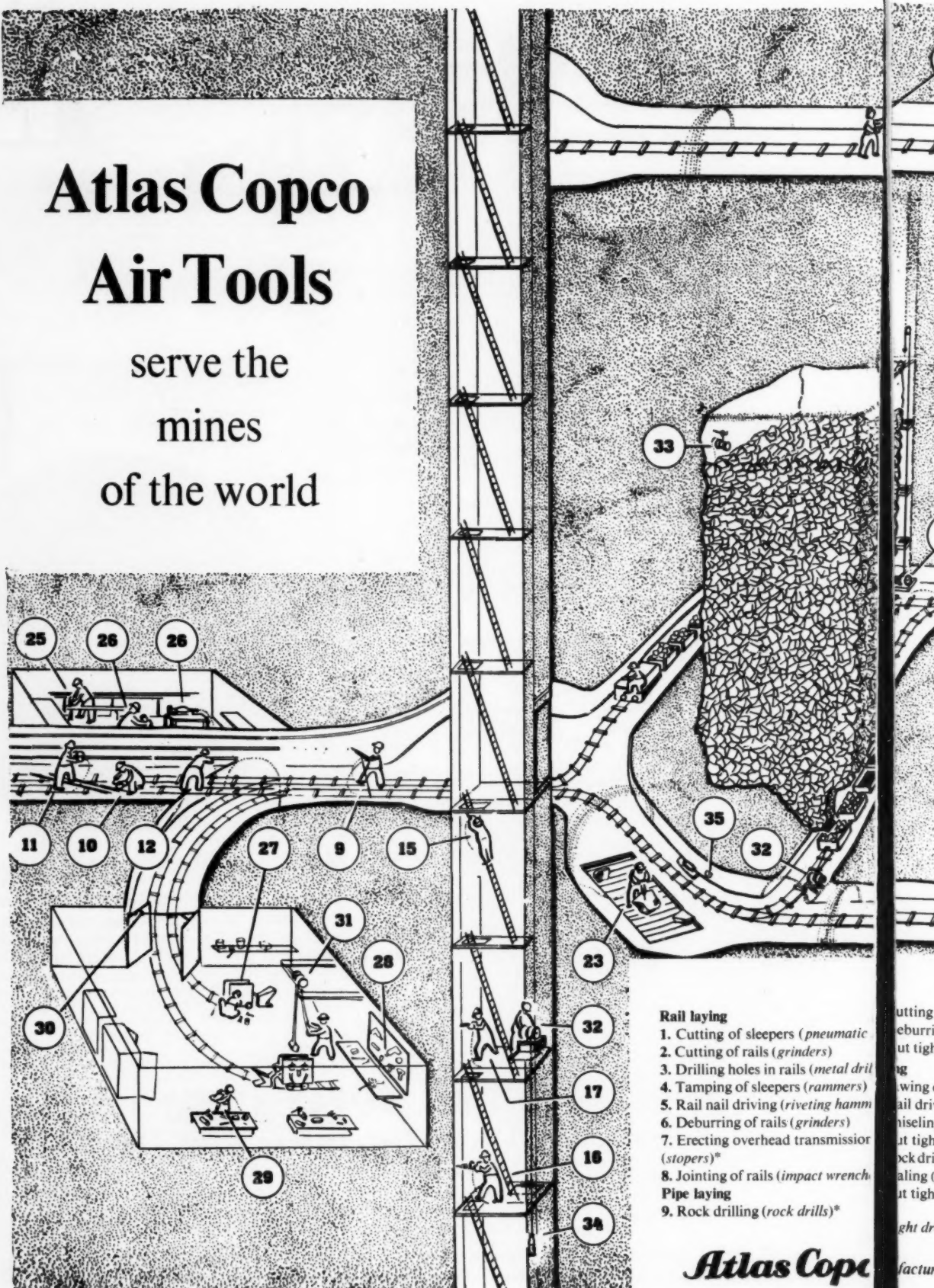
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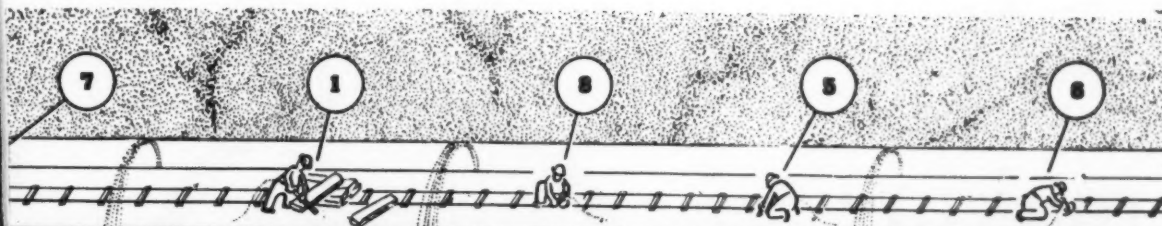
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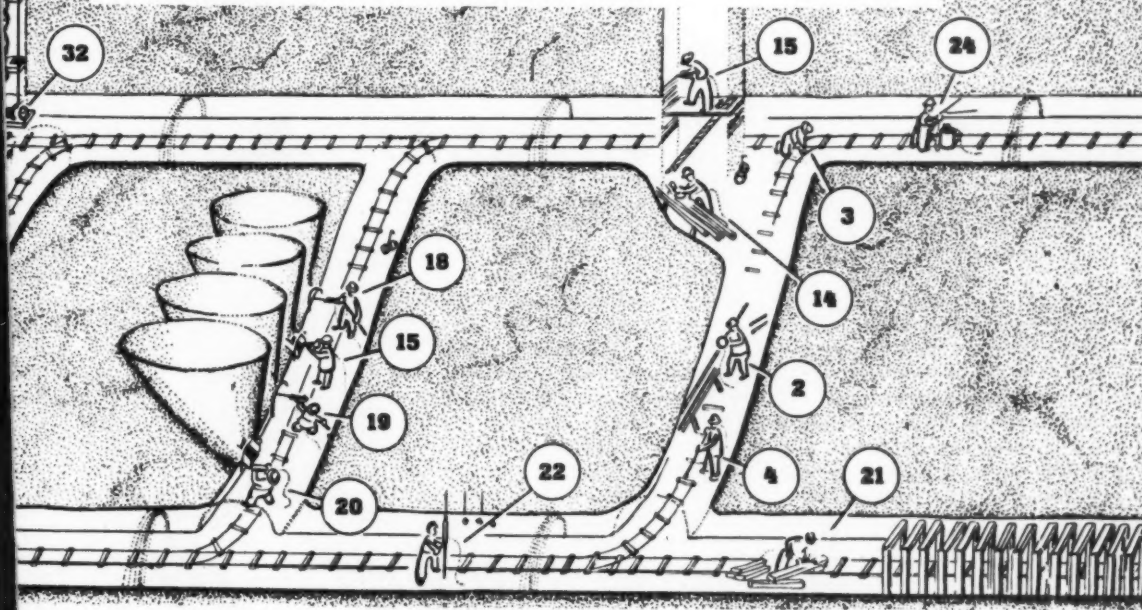


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# The Mining Journal

London, May 23, 1958

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## The A-Bomb Goes Underground

THE underground detonation of a small nuclear device, first reported a month or so ago in Operation Rainier, gives rise to speculation on the practicability of employing similar measures in mining applications. It will be recalled that at the Nevada test site in September, 1957, under the offices of the United States Atomic Energy Commission, a small device was detonated 900 ft. below surface in a tuffaceous mesa. The device had an equivalent of 1.7 kilo tons of T.N.T., and the resultant blast provided 50,000 to 200,000 tons of broken and permeable rock and 400,000 tons of rock that was broken, but impermeable.

A most important result was that practically all of the fission products were trapped in highly insoluble fused rock, partly surrounding the source of the detonation. This immediately suggests a possible method of working low grade massive deposits by nuclear breaking followed by leaching. Indeed, the method might possibly provide one answer to the depletion of the world's economic mineral aggregates. It remains to be seen, however, whether immobilization of fission products would result in rocks of types other than those tuffs in which current experiments have been carried out.

Another interesting feature about which information is scarce or altogether absent, is the fundamental explosive action of a nuclear device. It would appear, however, that there exists a difference between atomic and conventional explosive action. The energy of a conventional explosive is dissipated, partly in the form of a shock wave and partly in the form of a comparatively large volume of expanding gas. It thus stands in sharp contrast to the nuclear, wherein a greater proportion of the available energy is released as a shock wave with only a small release of energy as a high-pressure gas.

This factor would seem to indicate a particular application for a nuclear explosion in producing fragmentation without large displacement. Having formed a large body of fragmented material without any appreciable displacement from the original *in situ* position, a safe leaching method would then have to be devised, and here it would be extremely important to avoid contamination of the leaching liquors with any remaining radioactive material. Under the conditions obtaining at the Nevada site, nuclear detonation would appear to be a reasonably straightforward operation. But where the products were either not immobilized by fusing at all or where they could be leached out of the fused mass, extremely hazardous operating conditions would inevitably ensue and the applicability of the method would be seriously impaired.

The Livermore branch of the University of California Radiation Laboratory is now engaged in "Project Ploughshare", an investigation into the possible application of nuclear detonation for peaceful purposes. In this research, considerable information was obtained from the Rainier explosion and from the studies that followed. It has already been suggested that besides the applications mentioned, other possible peaceful uses of a similar device might include first, the generation of steam power; second, the movement of earth in quantity under such conditions as might possibly be

required in large canal excavations; third, the improvement of oil permeability in oil sands and the production of oil from oil-bearing shales by a combined process of crushing and heating; and fourth, a further investigation of the make up of the earth's crust from seismic studies of earth waves that result from deep underground detonation.

No indication has been given of the costs, or availability, of small nuclear devices. Statistics indicate that the efficiencies measured in terms of T.N.T. equivalent are comparatively low, and it is difficult to assess the overall cost in relation to the tonnage likely to be broken. In the experiments so far conducted, it has been shown that 17 lb. of T.N.T. equivalent would be required for each ton of loose and permeable rock produced. However, many more tests must be completed in various types of ground before any firm indication of the economics of nuclear blasting, or indeed its applicability in general, can be assessed.

### ELEVEN YEARS ON

The eleventh annual report and accounts for the nationalized British coal mining industry has just been published and, as anticipated, revealed a financial loss of £5,300,000. As previously reported in *The Mining Journal* total coal output in 1957 was 223,600,000 tons, representing an increase of 1,400,000 tons on 1956—due almost entirely to expanded opencast operations.

The total cost of production of deep-mined coal was 81s. 6d. a ton (before charging interest) and selling price 82s. 1d. Comparative figures for opencast coal were 58s. 5d. and 72s. 2d. Due to an unexpected fall in demand, undistributed stocks held by the Board at the end of the year were 8,600,000 tons—more than twice the normal figure.

Quite apart from tying up capital, stocking involves extra handling costs and no doubt the marketing department of the Board must have had second thoughts about the wisdom of their decision at the beginning of the year to drastically curtail exports.

Although output per face shift, including power loading, reached a record 3.36 tons—2.86 in 1947—this cannot be considered a phenomenal performance when one considers that approximately one-quarter of the raised and weighed output was power-loaded. If one makes an adjustment for dirt content it can be shown that the productivity on normal hand-filled faces is still less than 3 tons per manshift.

Twenty years ago national face O.M.S. was 3.10 tons. The discrepancy cannot really be explained away by the usual pleadings that seams are getting thinner and distances from the shafts increasing. Surely it seems reasonable to assume that these so-called "ailments of an extractive industry" have received some remedial treatment!

What of the great increase in mechanical coal cutting, the increase in explosives used and the costly improvements in haulage and man-riding facilities? These measures are all aimed at reducing the arduous task of the miner and, at the same time, improving production but, unfortunately, results do not suggest an unqualified success.

However, all comparisons with pre-war statistics do not reflect discredit on present-day operations. Despite a rise in the number of fatal and serious accidents which occurred last year, the fact remains that the fatal accident rate is only half that of the immediate pre-war years. The use of the word "only" in the previous sentence must be considered carefully, for whilst no one can be complacent about a fatality rate of 0.22 per 100,000 manshifts, this figure does reveal a tremendous improvement in safety standards underground.

The Mines and Quarries Act 1954 came into operation on January 1, 1957, and this required considerable action by the Board since its provisions imposed more stringent safety requirements in nearly all aspects of work in the mines. Probably, it is in this all-important field of safety that the Board has made the most significant progress in a determined attempt to cut the cost of mining in terms of lives and limbs.

### "EXCITING" NEW USES FOR LEAD

"With new markets developing in the atomic, electronic, plastic and other industries with great growth potentials, the future of lead is tremendously exciting," said Mr. Robert L. Ziegman secretary-treasurer of the Lead Industries Association, in a paper presented earlier this year before the American Institute of Mining, Metallurgical and Petroleum Engineers.

Examples of these "exciting" new uses for an old metal are given in the current issue of *Lead*, the quarterly publication issued by the Lead Industries Association.

As a typical instance of the extent of one company's utilization of lead shielding in commercialized atomic power, two specific, yet in the main technically unrelated, applications are cited—the Southern California Edison Co.'s sodium reactor experiment (SRE) and a low-priced miniaturized laboratory reactor—both designed by Atomics International, a division of North American Aviation Inc.

Lead is widely used in both commercial and military atomic plants for mobile gamma shielding; i.e., for loading uranium fuel into the reactor and removal of any hot elements penetrating into the reactor core.

Besides employing it in what might now be termed this conventional manner for the SRE, Atomic International Engineers have also taken advantage of the unusual properties of this metal in the construction of a reflector shield for a small 5-watt laboratory reactor. This reactor, designed for schools, medical and industrial laboratories, has as a unique feature a 6-in. thick lead neutron reflector—primary shield weighing approximately 3,800 lb., which surrounds the core vessel containing aqueous uranyl sulphate, homogeneous fuel suspension. This is believed to be the first reactor to employ lead as the only reflector material.

When the secondary shield water tank is drained, access to the interior of the tank is permitted, since the lead acts as an effective shield against residual gamma radiation from the core. Moreover, the lead acts as an essentially infinite reflector. This means that experimental apparatus installed at or near the reflector surface will not perturb the neutron balance in the core itself and no hazard is presented by movement of equipment during operation in the vicinity of the reflector surface. A third advantage is that pressure resistance of the core vessel against sudden surges arising from any source is greatly increased.

The latest developments in the use of lead compounds lend emphasis to their unusual capabilities. Some of these developments are completely unheralded and indicate that only the imagination limits the extent to which they can be employed.

For example, the essential material or component in a system developed for the U.S. Army's Nike-Cajun rocket is lead sulphide, which is being used to obtain data on naturally occurring water vapour in the earth's gaseous envelope, an International Geophysical year experiment. This function depends on the ability of lead sulphide to control electrical energy under the influence of radiation.



Other practical uses for lead sulphide include sub-miniature resistors, the overall size of which is comparable to that of a crimped paper staple. Their signal to noise ratio is excellent, particularly in infra-red, and vibration does not affect them. Furthermore, lead sulphide photoconductive cells, in combination with infra-red lighting, form an integral part of a process for superimposing an optical-magnetic sound recording on motion picture film without affecting the optical track—a process which may foster multi-lingual films.

Other lead compounds are being selected for use in electronic and power generation. It may be that future household refrigerators will depend on lead telluride's ability to cool under the influence of voltage change.

At a time when lead is suffering from temporary oversupply, confidence in the long-term future is enhanced by the assurance that demand will be governed not only by the expansion of established outlets but also by the uses which this unique metal is already finding in new industries still on the threshold of their growth.

## AUSTRALIA'S URANIUM INDUSTRY

Australia's large undertaking, Mary Kathleen Uranium, has planned to commence production by March, 1959, but it is expected that the plant will be in operation before that date. The company will sell uranium oxide to the U.K. Atomic Energy Authority with whom a contract has been arranged to a value between £40,000,000 and £45,000,000; this is expected to cover a period of eight to nine years, and the annual production is estimated at 500 s.tons per annum. When full production is reached the total funds in the project, including working capital, will be approximately £13,000,000.

The township at the mine has been completed and contains 221 houses, sports oval, swimming pool, community store, canteen, beer garden, open-air theatre, fire station, hospital, bank, post office, and two churches. There is also a dam on the Corella River, with a capacity of 3,000,000,000 gals. for the supply to the works and town, and with the provision of this water supply, extensive tree planting has been done.

On the mining side 629,084 tons of rock have been excavated from the lode; this total comprises 417,390 tons of overburden, and 211,694 tons of ore which has been stockpiled, pending completion of the treatment plant. The mine, which is open cut, has now been developed to a stage at which it can be brought into full production as soon as the mill is ready.

Rio Tinto Ltd. holds 51 per cent of the issued capital in Mary Kathleen Uranium Ltd., its associates 5 per cent, Australasian Oil Exploration Ltd. 35 per cent and the discovery syndicate 9 per cent.

Another Australian uranium producer will be United Uranium N.L., in the Northern Territory. The U.K. Atomic Energy Authority has indicated that this company will benefit under the guarantee given to the Australian Government to buy uranium oxide from the South Alligator River locality. Negotiations on the details of the contract are proceeding. The South Australian Department of Mines has developed research into uranium treatment to a high standard and has prepared a plant flow sheet and specifications.

At the El Sharana Mine, open-cut ore is being stockpiled and about 20,000 tons are ready for transport to the concentrating plant, the adaptation of which to the mine ore is now reported to be well advanced. Cartage of ore is a

dry season operation and the Northern Territory Administration is preparing to commence road construction.

When this undertaking is in operation, together with the Mary Kathleen Mine, there will be four plants producing uranium oxide in Australia: the Mary Kathleen, United Uranium, Rum Jungle and the Radium Hill plant.

## MINING IN ALBANIA

Except for mineral oil the considerable geological riches known to exist in Albania were lying largely untapped before 1939.

Oil was first discovered in Albania, then a Turkish province by Coquand, a French geologist at Selenitsa in 1868. Selenitsa, to the north-east of Vlonë (Valona), is still a centre of the country's oil activities, but the real focus is north of Selenitsa at Pathos where one of the two refineries built with Soviet aid after 1945 is located. According to the second Albanian five-year-plan (1956-1960) oil is to become the basis of the country's chemical industry which is being developed entirely from scratch. It is intended to complete the first petrochemical works by 1960. The refinery at Pathos, placed on stream in 1957, has a throughput capacity of 150,000 tonnes, the same as that of the older refinery at Cerrik. The combined output of the two refineries is far in excess of domestic demands for oil products, and these, as well as crude oil, form a rapidly expanding item of export not only to eastern countries such as the Soviet Union, Bulgaria, Czechoslovakia, Hungary, Poland, but also to countries in the west such as Italy. It is believed that output in 1956 reached some 750,000 tonnes.

It is certainly a fact that exploration, mainly in the western half of central and southern Albania, has been greatly intensified under Soviet expert guidance, and that important new oil deposits have been discovered. The oil, however, is generally reported as being very asphalt-bearing and thus not particularly suitable for the production of petrol.

Coal mining has also progressed in recent years. The existence of hard coal deposits in the north has been known for long, but before the war there was practically no demand for coal in Albania and mining was therefore unattractive, more especially as transport between the north-eastern areas (Kuksi) and the interior or the ports was not available. The position is different now. Although industrialization in such a backward country as Albania is a slow process, the demand for coal is rising and exports are also expanding. Roads have been built and motor transport is available. No wonder that, compared with the insignificant volume of coal mined before the war, the annual output had risen by 60 times in 1956.

The position is similar in respect of chrome ore, of which Albania has become a comparatively important producer in recent years. Chrome ore is being mined near Tropoje and Krume in the most north-easterly frontier area close to Yugoslavia, also near Pogradec on Lake Ohrid (the western half only of the lake is in Albania). Reserves in the north-east are estimated at 500,000 tonnes and those near Pogradec at 20,000,000 tonnes (contents of both localities, 50 per cent Cr). In 1956, the output of chrome ore, all told, was 18 times higher than in 1938. Albania has no use for chrome ore at present and all the ore is being exported, the principal buyers being the Soviet Union, Czechoslovakia and Poland.

Iron ore is mined in the same region as chrome ore, and this ore too, pending the establishment of an iron and steel works in the country (envisaged by the second five-year plan), finds its way to destinations abroad.

# Yugoslav Mining and Metallurgy in 1957

**Y**UGOSLAV mining and metallurgy made important progress during 1957. This was the first year in which the plan for the economic development of the country was actually realized. This success has been achieved as a result of more favourable economic conditions, an improved supply of electrical energy, a more settled home market, the commissioning of new plants and the better use of the existent ones, and greater productivity of workers.

Production of the coal industry in the past year amounted to 18,007,000 tonnes, 900,000 tonnes higher than in the previous year, and 2½ times higher than before the war. Particular importance is attached to the increase in lignite production, which during 1957 amounted to 8,255,000 tonnes—800,000 tonnes more than in 1956—and representing about 46 per cent of total coal production. The production of brown coal and pit coal remained generally at the same level as in 1956.

Among the most important coal plants which became operative were a new preparation plant in the brown coal Banovici mine, Bosnia, with a capacity of 1,500,000 tonnes, a new dry kiln at Kolubara, Serbia, with a capacity of

of pig iron rose by 80,000 tonnes to about 714,000 tonnes, and output of steel ingot by 160,000 tonnes to about 1,050,000 tonnes.

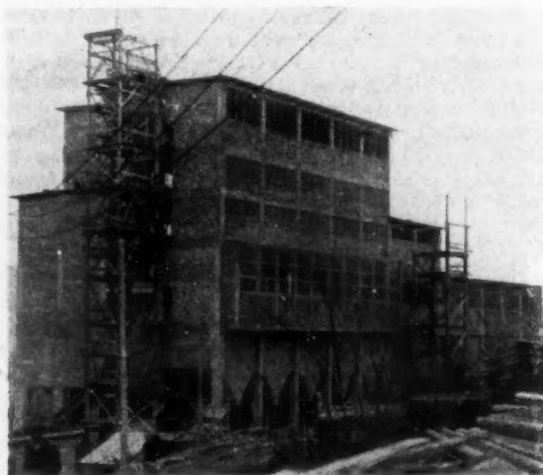
In the non-ferrous metal industries substantial increases in production were achieved during the same period. Production of copper ore increased by some 210,000 tonnes to 1,953,134 tonnes, and that of lead-zinc ore by 40,000 tonnes to 1,763,937 tonnes. Outputs of bauxite, manganese, chromium and antimony remained at appreciably the same levels as in 1956.

Production of blister copper, electrolytic copper, refined lead, zinc, antimony and aluminium was also bigger than in the preceding year, but production of quicksilver, bismuth and silver was rather smaller than in 1956.

*By*  
**BRANKO DJUKIC**

800,000 tonnes of dried lignite yearly, and new plants at the Kreka mine, Bosnia, and Velenje mine, Slovenia, which allow an annual production in both of these mines of 4,000,000 tonnes.

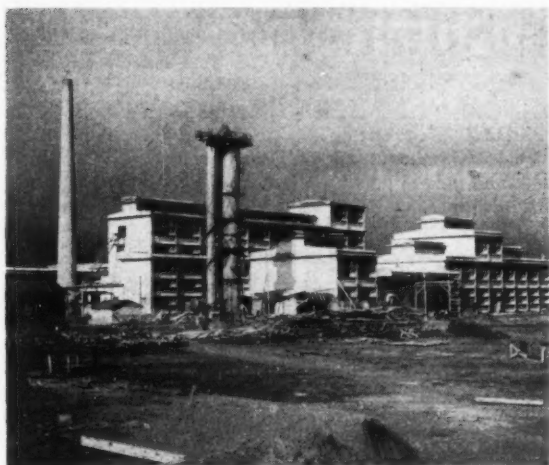
Further expansion of the steel industry has also taken place. Output of iron ore in 1957 amounted to 1,876,000 tonnes, that is, about 150,000 tonnes more than in 1956 or about three times more than before the war. Production



Above : A separation plant at the underground coal mine in Rosa, Croatia

Below : The Kiksic iron works in Montenegro





A start was made during 1957 in the manufacture of ferro-alloys at Jegunovci, Macedonia, while a new kiln for the production of ferro-manganese and silico-manganese was brought into commission in the ferro-alloys factory in Sibenik.

A number of new ore deposits have been opened up, among the most notable being lead and zinc deposits at Kiznica, Serbia and Srebrnica, Bosnien, and a bauxite deposit in Montenegro.

Production of sinter-magnesite at some 75,000 tonnes was 12,000 tonnes higher than in the preceding year or 37 times more than before the war. The output of fire-

#### A ferro-alloy factory in Macedonia

proof materials at 117,000 tonnes, was 10,000 tonnes more than before the war. Significant gains were also made in the production of ceramics, flat and hollow glass, raw magnesite, asbestos fibre, and electro-porcelain.

Greater production was attained in 1957 in all branches of the mining and metal industries as compared with the previous year. The greatest increase was recorded in the non-ferrous metal industry in which productivity was 18 per cent greater than in 1956. The lowest was recorded in the coal industry where productivity was only 4 per cent greater than in the preceding year.

The great increase of production achieved in 1957 led to a substantial rise in exports. The value of the exported products of the mining and metal industries amounted to some 29,000,000,000 dinars and was 17 per cent more than in the preceding year. Non-ferrous metal products accounted for 58 per cent of the total metal exports.

In spite of the steep drop in prices of the non-ferrous metals in world markets during 1957, the export of non-ferrous materials rose in value by nearly 17 per cent as compared with 1956, thanks to the higher volume of shipments.

Apart from the steel industry, exports by all other branches of the mining and metal industries were also higher.

Much progress was accomplished during the year towards the improvement of health and safety and better accommodation for workers, as well as the efficient education of miners and metal workers. Raw material supplies also improved.

## Mine Ore as a Grinding Medium

**I**N an article in *The Northern Miner*, November 28, 1957, B. S. Crocker says, "In nine cases out of ten your own ore can be used more efficiently and far more economically to do the grinding job". He was, of course, comparing the use of mine ore and steel balls, and there is no doubt that this practice has increased recently, but there are other views.

About the same time Rose and Sullivan, of King's College, London, wrote in the newly-published *A Treatise on the Internal Mechanics of Ball, Tube and Rod Mills*, "Also in some cases, though rather rarely, large pieces of ore are used as a grinding medium. It appears, however, that only in the case of extremely high costs for the carriage of replacement balls can the use of such lumps of ore be justified on economic grounds; since the grinding efficiency is adversely affected thereby and the milling cost correspondingly increased".

#### Increasing Use of Mine Ore

The use of mine ore in North America has certainly increased and we also learn from *The Engineering and Mining Journal* that "Mr. Crocker says that such mills are also in use in South Africa". Perhaps it would have been better to say that the Rand mines were using a pebble load picked from mine ore long before it was even considered in North America.

As Crocker points out, however, capital cost is somewhat higher but is claimed to be offset by reduction in total running cost. Using Lake Shore figures as an example, he shows that up to 38 c. per ton can be saved, largely in

the cost of steel balls and liners but up to 7 c. can be attributed to finer grinding and other factors. Greater flexibility, owing to the ease with which media can be changed, as well as greater versatility also is claimed.

#### Influence on Chemical Change

Chemical changes in grinding are also influenced. For example, less oxygen is consumed with pebbles so that more may be available to assist in cyanidation but when flotation is employed, the additional oxidation may be detrimental as it appears to cause the "phantom oxide" losses.

In the uranium mills of Bicroft and Faraday on the relatively coarse granite-pegmatite feed, about 3 per cent of the rated tonnage is by-passed, the secondary crushers and rod mills being consumed as media.

Experiments at the Mines Office, Ottawa, have indicated that grinding with screened pieces of ore from a medium soft copper-lead-zinc ore was successful and did not affect subsequent flotation. In this report, L. E. Dymheuzian (*Technical Advances in Milling and Process Metallurgy—Can. M.J.*, February, 1958) describes the trend to use more ore as media, and continues to list the extended use of hydro-cyclones, the development of flotation controls in flotation and work done at Sullivan.

Amongst other current practices are the use of double leaching at Beaverlodge, the employment of moving bed ion exchange at Consolidated Denison, and modifications in filtration usage.



# Research on Silicosis

*The final set of papers presented at a Conference held in Toronto in October, 1956, has been released by the McIntyre Research Foundation. These papers are briefly summarized below.*

**A**T the McIntyre Research Foundation Conference on Silicosis and Other Industrial Pulmonary Diseases, held at Toronto on October 22, 23 and 24, 1956, a number of interesting papers were read.

## Effect of Inhalation

In his paper, "The Practical Significance of Amounts of Silica Retained in the Lungs", T. M. Durkan, M.E., Associate Director, Saranac Laboratory, Saranac Lake, N.Y., dealt with the effect upon pulmonary tissues of the inhalation of siliceous dust and its accumulation and retention in the lung. Findings of interest and importance were illustrated by a set of eight tables showing various case figures.

He said that in earlier analyses of lung tissue containing siliceous dust only the total silica value was determined. Later, methods were developed by which the free silica content of a specimen could be calculated from findings obtained with a special chemical. Twenty years ago, Badham and Taylor were able to report a value for free silica and for the combined silica component of each specimen, though some cases may not have been free from error, especially in the dry-ashing of the tissues and the analysis of the tissue ash, in respect of which Bailey had reported cases where dry-ashing of lung tissue at 450 deg. C., or higher, destroyed the crystalline structure of the quartz particles. Present chemical procedures, in conjunction with the X-ray diffraction technique and petrographic examination determined rather accurately the amount of free silica, though methods applicable to amorphous forms such as diatomaceous earth were still not entirely satisfactory.

Mr. Durkan said that analyses revealed that substantial variations may occur in the distribution of dust throughout both lungs. Generally, though not always, the tracheo-bronchial nodes contained more silica than the corresponding lung. Classification of various cases indicated that, for persons exhibiting the same degree of silicosis, one would expect to find the concentration of silica in the lungs about twice as high for coal miners as for sandstone workers. The total silica value of the dust retained in the lung could be higher in the case of a non-silicotic than for a silicotic.

The total weight of dust in the entire lung may have greater significance than its concentration in the tissue. Various methods of determining the ratio of the weight of quartz to the weight of the lung were discussed, including those used by Badham and Taylor, King and the Saranac Laboratory and tables of results were shown, in reviewing which the author recalled the suggestion of Mavrogordato that the minimum quantity of dust of fibrosis-producing size to set up a Witwatersrand simple silicosis was from 1.5 to 2 grams.

From the data it would appear that the opinion authorized by the Conference of Experts on Pneumoconiosis,\* namely that the "quantity and kind of dust

found post-mortem in the lungs could not be accepted as a criterion in estimating the presence or degree of pneumoconiosis", was too restrictive a statement. Though these should not be the only criteria in making a diagnosis, when used in conjunction with histological examination they were often invaluable as an aid and guide.

Several papers were read on dust control in mines and among them was one by E. A. Perry, Manager, Hollinger Consolidated Gold Mines Ltd., entitled "A Review of Dust Producing Conditions and Their Means of Control at the Hollinger Mine". After describing the Hollinger plant, both underground and surface, and the process of producing and treating ore, Mr. Perry spoke about dust determination procedure, dust producing conditions and the means of suppression of control.

Dust samples were taken with a circular Konimeter, 5 cu. cm. of air being impinged against a sticky glass slide and the samples treated with heat and acid prior to estimating the siliceous content of the air. This was done by examining the samples with dark field illumination at a magnification of 150 power and counting the particles between 0.5 and 5.0 microns in diameter.

Drills were now equipped with automatic air and water throttles and the average dust count in stopes using these types of drills was now about 350 particles per cu. cm. compared with more than 550 particles per cu. cm. in 1930 and 250 particles per cu. cm. in 1940. Using the jackleg equipment in a drifting operation, where ventilation was less positive, the dust count was 400 particles per cu. cm. and a stoper used in an untimbered raise produced a count of 700 particles per cu. cm., a diaphragm type filter mask being worn for this task.

Blasting, a major source of dust, gave a concentration of dust too high for representative counting, and the necessity of a positive ventilation system was apparent. A further means of dust suppression was by fine water spray.

## Movement of Ore

Mr. Perry said that dust counts of 400 particles per cu. cm. for the slusher in a stope and 450 particles per cu. cm. for a mucking machine in a drift contrasted with 250 particles per cu. cm. and 350 particles per cu. cm. previously with manual work. Ventilation, water spraying and the wearing of masks could alleviate the condition.

Dust counts in the area where the ore cars were loaded from the mill hole chutes were about 350 particles per cu. cm. but this condition was offset by air movement, though sometimes a blower was installed.

The dumping of ore cars into an ore pass did not cause a dust control problem, though the ore pass system did, where it was located next to the fresh air supply, due to the creation of fine dust by the falling rock in the pass and the tendency for the pass system to act as an air passage way, dispersing the dust formed throughout the mine workings. The latter had been mostly obviated at Hollinger by isolating the pass system from the ventilating system. Ore control chutes had been enclosed and both ore and waste pass dumps had been fitted with pneumatically controlled, gravity closing air-tight doors. Dust counts now averaged 300 particles per cu. cm.; previously they were ten times this figure.

Thenceforth in the ore flow, control was required only over a single dust source, since all the ore passed through a 6-in. opening of a 48 in. x 60 in. underground jaw crusher.

\* Third Inter. Conf. at Sydney, 1950

From leaving the ore pass, which feeds the crusher, until discharge on to the conveyor belt for delivery to the loading pocket, the ore and all equipment were enclosed in a single air-tight sheet metal cover and a fan drew any dust formed through a bag filter system, recirculating the cleaned air. Similar practices prevailed at the point of discharge from the conveyor belt and at the skip loading pocket. Before enclosure, the dust counts were over 1,000 particles per cu. cm.; now they were about 150 particles per cu. cm. Dust sources in the crusher buildings were all hooded and the dust counts in the building were below 150 particles per cu. cm.

To date, said Mr. Perry, there had been 352 cases of compensatable silicosis; 337 of these were attributable to men employed prior to 1929, when X-ray examination was begun. Of the remaining 15, eleven had mining histories which started before 1929 and four had mining histories which started after that time. As a matter of interest, the dust exposed time worked by the 15 cases referred to was 251 man-years. From the beginning of 1930 to the end of 1955, dust exposed time worked at the mine was 40,800 man-years.

### Twelve Years of Dust Control

Dr. L. Sweterlitsch's paper, "A Twelve-Year Control Programme of Silicosis 1944-1956" set out preventive efforts put forth toward dust elimination in a typical jobbing foundry. Aluminium therapy was begun at this plant in 1944 and the programme was considered to have borne fruit, as evidenced by the lack of incidence of silicosis as interpreted by X-ray diagnosis.

In describing the Foundry Machine Division, Blaw-Knox Co., Corapolis, Pa., which was the subject of the paper, Dr. Sweterlitsch said that all operations were performed under one roof without any partitions, natural ventilation being augmented by mechanical exhaust ventilators. Operations which produced the highest dust concentrations, listed in order of greatest hazard, were: shakeout, sand mill, flogging, silica wash.

Control of silicosis was achieved by dust elimination and aluminium administration. To achieve this the entire shop area of each department was now sprayed with water at least once in each 24 hours; the practice of employees using compressed air for cooling themselves, cleaning castings, equipment, blowing out moulds, etc., had been reduced; vacuum removal of accumulated dust and increased exhaust ventilating from 149,510 cu. ft./min. to 338,510 cu. ft./min., of which 26,000 cu. ft./min. was in static type roof ventilators and the rest in electrically-driven propeller types. Other preventive measures have included roof ventilators above the core rooms and Plancor sand bins and over the quench tank aisle, duct work over the shakeout pit and hoods, oiling of floors, and a fine water spray operated near the shakeout previous to, during, and after operations there.

Dr. Sweterlitsch said that it had been instructed that respirators be worn in spraying silica wash, grinding chills, rubbing and cutting cores, operating the shakeout machine, sand milling, flogging, operating sand slingers and sand systems and handling silica bags.

The aluminium administration programme involved physical examination with X-ray, blood tests, repeated chest X-rays, aluminium oxide inhalation, reliable records of X-ray findings and aluminium administration. Dr. Potter's method was used for chest X-ray classification.

Now, the aluminium programme was available to all employees desiring it. Treatment was for five minutes a week in continuous treatment, 30 inhalations a year generally

being considered adequate. In 1955, 356 men started the treatment, 92 per cent of whom completed the course. Since 1944, 30 men had refused the treatment without giving any reasons. Three men were given treatment at one time. Each department was scheduled on a definite day and time, and the men inhaled the aluminium oxide powder by means of a metal mouthpiece between the lips. Currently, only twelve employees had serious X-ray findings, and, of these, ten were from the group of 98 diagnosed as serious when the programme was begun in 1940.

### An Improved Aluminium Powder

"The Physical and Chemical Characteristics and the Commercial Manufacture of a New McIntyre Aluminium Powder" was the subject of a paper presented by T. E. Newkirk, J. W. G. Hannon and A. D. Campbell. The paper embodied conclusive results obtained by research and experimentation over a period of years leading to the production of a new improved McIntyre aluminium powder. By the use of controlled temperature and humidity, the new fine powder, which had consistently identical physical and chemical characteristics, could now be manufactured.

Following a brief description of the mills used to produce aluminium powder, the authors described experiments undertaken to determine what conditions were affecting production and what controls would be required to produce consistently the powder now available. These resulted in the development of a finer and improved powder known as M-38 with a metallic content of 13 per cent. Sizing tests showed that more than 96 per cent of the powder particles were of 1.2 microns or less in size, while 88 per cent were of 0.8 microns or less. There was also a considerable background which appeared to be powder too small to count under the 1,500 magnification used.

Dispersal tests were also made comparing the number of particles up to 1.2 microns in 1 cu. cm. of air, 8, 30 and 60 minutes after dispersal, using also for comparison 1001, a powder ground previous to installing controls in the manufacturing process and DR, the original metallic aluminium powder. The results were as follows:—

After 8 min.	M-38	47,658	p.p.c.c.
	1001	31,388	"
	DR	7,748	"
After 30 min.	M-38	37,689	"
	1001	20,128	"
	DR	6,537	"
After 60 min.	M-38	27,355	"
	1001	15,401	"
	DR	4,854	"

Chemical analyses of the powder M-38 showed metallic aluminium approximately 13 per cent, aluminium oxide approximately 87 per cent. Solubility tests showed that the powder M-38 was highly efficient in reducing the solubility of silica and was superior to other powders previously produced. Further experiments showed that, with a moisture content of 8 grains per cu. ft., a powder with characteristics identical with M-38 could be consistently reproduced.

During the investigations, 632 tests were carried out in triplicate in all, and the authors believed that the cumulative effect of improved lung penetration, due to the finer powder, together with the increased depression of the silica solubility provided a protection more effective than that previously achieved.

Since the presentation of the paper, quantitative biological tests at the Saranac Laboratory had shown the improved powder to be superior to all previous powders in neutralizing the fibrosis-producing qualities of silica.

## British Standards for Rubber Cables

**C**ERTAIN amendments are to be made by the British Standards Institution in respect of B.S. 7 (1953) for rubber-insulated cables and flexible cords and related specifications. This is partly as a result of recommendations from the Commonwealth Conference on Standards for Electric Cables held in London in 1953, which were basically concerned with modified insulating and sheathing compounds, and partly in order to take advantage of modern manufacturing methods, which make possible the omission of tape from common sizes of conduit wiring cables. A new B.S. 2899 (1958) is to be created which will cater for general-purpose vulcanized rubber insulation, fire-resisting insulation and ozone-resisting insulation and for the existing four types of sheaths. For both insulation and sheaths specifications are now to be defined in terms of volume instead of weight.

Whereas, under B.S. 7 (1953), the limits of the rubber content in compounds for general-purpose vulcanized rubber insulation were set at 45 per cent by weight minimum and 50 per cent by weight maximum, which normally resulted in a compound containing about 70 to 75 per cent by volume of rubber, the recommended limits are 50 per cent by volume minimum and 60 per cent by volume maximum. The new tensile strength specification has been set at 1,250 lb. p.s.i., but ageing resistance control specifications are unchanged. The minimum values for insulation resistance are reduced to 25 per cent of those in B.S. 7 (1953) and this applies also to B.S. 883, 708, etc., where the same insulation is employed.

In the case of fire-resisting insulation, which is a composite insulation having the same dimensions as 250 V. or 660 V. vulcanized rubber types, but having an inner layer of vulcanized rubber compound, and an outer layer of vulcanized polychloroprene compound, the new British Standard contains appropriate physical, ageing and fire-resisting tests for quality control. These call for spark testing and voltage testing as for vulcanized rubber, with insulation-resistance requirements 80 per cent of those for the new vulcanized rubber insulation.

For ozone-resisting insulation used for h.v. cables, the British Standards Institution has incorporated the B.S. 7 (1953) test in the new specification B.S. 2899, and this must be satisfied, together with the electrical requirements of the appropriate cable specification.

As in the case of insulating compounds, sheathing compounds under the new B.S. 2899 (1958) will be called upon to contain somewhat less rubber than under the present standards specification and tensile strength specification will be reduced to a minimum of 1,200 lb. p.s.i., but, again, there will be limits for the accelerated ageing as in B.S. 7 (1953). This, in effect, allows a return to pre-war practice in respect of rubber content.

Since much core is now made by the continuous vulcanization process, in which the rubber compound is extruded on the conductor and the whole passed immediately into the vulcanizing tube, the necessity of applying tape to the core has also been considered by the British Standards Institution, and, following many tests and experiments carried out by members of the Cable Makers Association with and without the use of tape and practical installation tests carried out by a large-scale user, it has been agreed to omit the requirements of tape from smaller sizes of cable, and an amendment to B.S. 7 in this respect will be made.

Whereas B.S. 7 (1953) deals more specifically with the quality of insulation, the new B.S. 2899 (1958) uses quality specification for the general purpose vulcanized rubber and fire-resisting insulation but relies on specified tests and minimum performance requirements for the ozone-resisting insulation; thereby, in the latter case, allowing manufacturers more flexibility in choice of materials, which is regarded by manufacturers as a step in the right direction.

With a view to giving manufacturers the greatest freedom in producing technically satisfactory cables, the Cable Manufacturers' Association is carrying out experimental work with the object of framing proposals for a British Standard based purely on tests and performance requirements, which will ensure a satisfactory product but allow choice of natural or synthetic manufacturing materials.

## Ilmenite in Gambia

**T**HE Gambia is a small territory which until recently had only one export of importance: groundnuts. However, in 1953, ilmenite deposits with a high titanium dioxide content were found on the coast south-east of Bathurst. Ilmenite-bearing sand had been located by Dr. Joyce and his prospectors on many stretches of the Coast but only at Brufut were they found in commercially exploitable quantities. The following year Gambia Minerals Ltd., a subsidiary of British Titan Products, was formed and agreements were made with the Gambia Government that the new company should mine these deposits, paying a royalty of 2.5 per cent of the selling price and normal company taxes. The maximum combined taxation was not to exceed 52.5 per cent of taxable profits for the first six years. Today, Gambia Minerals Ltd. is making regular shipments of ilmenite to its parent company in the United Kingdom. Unfortunately, Gambians, long tied to their one cash crop economy of groundnuts, felt that the new company would be a solution to their economic difficulties. However, the deposits are too small to warrant any such hopes. The difficulties confronting the company were from the outset considerable. A small 30-in. gauge railway had to be built to link the mining area with the dry

mill and the company offices some 5½ miles away. A road had to be constructed to join up with the main road to Bathurst. Finally Gambians, who had practically no mechanical experience, had to be trained to handle complicated machinery. About 650 Africans and 25 Europeans are employed. Africans are in charge of shifts on the dry mill and all the draglines in the mining area are operated by Africans.

The company is mainly concerned with the production of ilmenite, but by-products are zircon and rutile. The decline in production of titanium metal has had little effect on the company because of its concentration on ilmenite.

The mining operation itself is relatively simple. Draglines scoop up the sand and discharge it into hoppers whence it is passed over a screen which excludes stones and roots. The sand is then mixed with water and pumped as a slurry to the plant at the mine site, where it is passed over jigs to work off the light sand and let the heavy metals settle. These are then pumped into waiting railway wagons, taken to the dry mills by a small Ruston diesel engine where the metals are electrically separated, and transported to Bathurst for shipment to the United Kingdom.



## PRODUCTIVITY IN THE MINING INDUSTRY

**P**RODUCTIVITY can be of interest to the mining, metallurgical, ore dressing and geological branches of The Institution of Mining and Metallurgy. A miner is inclined to think that it refers to him as a matter of tons of something mined per man-shift, and so it does, but the metallurgist is continually thinking out new and better ways of getting a greater output (in terms of valuable constituents recovered) per man-shift. The ore dresser, too, makes a splendid contribution to productivity in his continual efforts to improve the technique of getting the best possible recovery of the metal the miner hands to him in the shape of ore. He adds to the amount of mineral of economic interest in the earth's crust simply because his continual inventions of new technique make it economically possible to work lower and lower grade material. The geologists have shown us wonderful examples of improved productivity in their capacity for examining large areas of the earth's surface in a shorter and shorter time.

Moreover, none of our four branches is entirely confined to just the work of that one branch. We specialize in one branch, but there are times when we all of us overlap into one or all of the other branches.

### South African Gold

Considering productivity in the South African gold mining industry, figures from the official *Year Book* of the Transvaal and Orange Free State Chamber of Mines show that from 1930-1957 the rise in tons per man-year is fairly constant. A large increase in 1932 compared with the previous year is of interest, as that was the year when we "went off gold" as the saying is, when the value of gold increased in terms of money.

There was a step down in 1941, a big recovery in 1942 and a bigger one in 1943, followed by four declines until 1947. From 1947 onwards there was a steady increase until 1953 and then a decline. This is balanced by an increase in gold productivity—an increase in grade—in those last five years. This was due to costs going up and the need to be more "picky", more selective, which produced the logical sequence of less tons per man. It is noteworthy that the number of ounces of gold produced per man-year is now approaching what it was in 1930 before the relaxation from the gold standard. This rather logically provokes the thought that when it reaches the 1932 figure of 53 oz. of gold per man per year the price of gold must go up again. In actual fact, of course, it must go up again before this figure is reached as costs are so much higher than they were then. Either that or the poorer and older mines must close down, and we know very well there is talk now of several of them—the "marginal" mines—having to do so.

In the March, 1958, issue of the *Journal* of the South African Institute of Mining and Metallurgy there is a paper contributed by Professor R. A. L. Black, of Witwatersrand University, entitled, "A review of progress in mechanization in the mining industry of Southern Africa during the last decade". In it he says that "the objects of mechanization are two: first, to reduce human effort and thereby make working conditions easier; second, to improve the productivity of the labour force. These two objects

In his Presidential Address to the Annual General Meeting of The Institution of Mining and Metallurgy on May 15, 1958, Mr. J. B. Dennison, A.R.S.M., chose as his subject Productivity, and discussed its application in the mining industry. The following article presents extracts from his address.

usually go hand in hand—better working conditions result in higher productivity, and it is usual to judge the success of a programme of mechanization by the results achieved in increased output".

He refers to a graph in his paper which shows the yearly productivity of the labour force at work in the gold mining industry since 1947. "The figure for tons milled per European fell sharply between 1949 and 1953 and is only now recovering the level achieved ten years ago. The productivity of the non-European labour force has increased by slightly less than 10 per cent in the ten-year period, and the increase for the total labour force is also less than 10 per cent. The large increase in mechanization which has taken place does not, therefore, appear to be reflected in a correspondingly large increase in the productivity of the labour force in this section of the mining industry".

You will see that this 1 per cent checks closely with the longer period of 27 years that I have examined above. This is not enough to counteract rising costs, which I think are of the order of 4 per cent a year all over the world. In this connexion I was very interested to read in the *Financial Times* of February 20 that Sir Miles Thomas had said at a luncheon the previous day that what we need is a "sustained annual rate of increase in productivity of 3 to 5 per cent". He was not talking about South African mining, or even of any mining, but of industry in general.

It would be very wrong to take costs per ton as a basis of comparison of efficiency of operation of the mines on the flat-dipping (almost horizontal) ore-bodies of the East Rand and Orange Free State with those on steeper dips on the Central and West Rand or on vertical (or almost vertical) lodes in Great Britain and other countries. The lashing problem on the latter hardly exists, whereas on the former it is a very serious matter. But while it would be wrong to take those costs as a basis of comparison of efficiency it would, of course, be a wise move for the investing public to take those things into account, provided the grades of ore were comparable.

### Ghana and Malaya

I would now like to consider some productivity figures from other fields—Ghana and Malaya.

Now here one finds the same kind of figures as the South African ones, but over the eleven years since the war instead of twenty-eight since 1930. Starting at 45 tons per man per month in 1945-46 there is a very large increase of nearly 25 per cent in the next year and the tonnage produced rose from 100,000 to 150,000 in that time. Next year there was an increase in tons per man, but a smaller one, followed the year after that by another large step up of 35 per cent from 58 to 77 tons per man per month. There was a slight drop for some reason in 1950-51 but then steady increases until

the large step up of 1954-55 from 97 tons per man per month to 117, or 20 per cent.

Looking at the overall figure for the years 1945-46 to 1954-55 it will be seen that there is an increase of no less than 160 per cent, or, divided by the nine years, 18 per cent per annum, a truly remarkable figure. But even if you take the figure to 1955-56 there is a rise of 86 per cent in those ten years.

Now the next set of figures deals with Malaya, and with no fewer than returns on six aspects of mining in that country—dredging, gravel pumping, hydrauliclicking, open-casting, underground and other methods.

In dredging, it is noteworthy that the production went up from 1946 to 1955 by no less than 1,500 per cent, although perhaps this is hardly a reasonable comparison in view of the fact that 1946 was the first year after the war troubles. In that same period of 10 years the number of men employed increased only by 76 per cent, from 682 to 1,203, and their efficiency, expressed in terms of tons per man per month, increased from 0.25 to 2.15 or 760 per cent.

Looking at gravel pumping, it is seen that efficiency of the labour force increased from 0.34 tons per man per month in 1946 to 1.25, or 270 per cent. Passing to hydrauliclicking, open-casting and underground, we see that, leaving out the 1946 year of rehabilitation, efficiencies increased in eight years by 95 per cent, 160 per cent and 200 per cent respectively or 12, 20 and 25 per cent per annum.

### Applications in Other Countries

It would be wrong to compare productivity figures in one deposit with those in another, for all deposits are not as simple to work. I am indebted to *The Mining Journal* of August 23, 1957, for some figures of output per man-day at three lead-zinc mines in Japan (Tochibora, Mozumi and Maruyama). It is recorded that they get 4.5 tons per man-shift. At Abbeytown Mine, Sligo, Ireland, once we had found the right way to tackle the underground job (after the quarrying operations) we were getting as much as 8.5 tons per man-shift underground and 4.0 tons per man-shift taking miners and all surface workers into account. Easy mining; 15 ft. by 15 ft. stalls at 25-ft. centres, mucking 200-ton rounds with large overhead loaders. Certainly not to be compared with 5,000-ft. deep narrow reefs in South Africa or Australia.

"We were getting", unfortunately, is the position. It is in the past tense. Two months ago, after making losses for nearly a year, we had to admit that world prices for lead and zinc had defeated even our low costs. We are planning to go on developing, ready for another try.

In the March, 1953, number of the *Bulletin* we had V. C. Allen's very good description of "Mechanization at an Upper Mississippi Valley zinc-lead mine". I will just quote you two short sentences from that paper. "On the

average output of 920 tons per day (two shifts) the underground force numbers 30 men or a production per man-shift of 30.6 tons"; and again, "The output of all employees (30 underground, 17 mill, 8 office, or 55 in all) is 16.7 tons per man". Critics may say "easy mining", and, of course, it was—after careful thought of how to do it. The grade of ore mined was so low, far below 1 per cent lead, that there would not have been any mining there at all were it not for their efficient working.

#### Survey of U.S. Research

The European Productivity Agency of O.E.E.C. has recently published (January, 1958) a booklet called *Low Grade Ores* which they describe as a survey of American research methods. Here is something which is closely connected with the mining industry. It deals with such matters as the organization of mineral research and development in Canada and the United States, at universities, by private companies and sponsored research institutes. They go into the question of education and training and give papers on ore production (commutation and classification, mechanical separation, chemical recovery processes, pyro- and hydro-metallurgy and agglomeration).

They deal with iron, nickel, cobalt, manganese, chromium, molybdenum, tantalum, niobium, vanadium, titanium, tungsten, copper, zinc, cadmium, lead, tin, aluminium, magnesium and gold and silver, together with some of the rarer metals such as germanium, lithium, zirconium and selenium.

The prices of most base metals are liable to such fluctuation that the overall picture can become distorted. But if you take a lengthy period it is by and large true to say that the 4 per cent per annum rule applies in this case too. Take lead, the price of which in May, 1946, was £45 a ton. Nearly 12 years later, in December, 1957, it was £69 a ton. It had been up to the dizzy height of £180 a ton in the meanwhile but you will see that the difference of £24 on £45 over those 12 years is 53 per cent making an average annual increase of 4.4 per cent. So it does apply in general to our products as well.

There was a time some years ago when one could take the costs of a mine as being 50 per cent labour and 50 per cent stores.

#### Factors in Labour Costs

All materials and stores prices are a function of labour cost; in fact they are all labour cost. Take, for example, some of the stores used in mines, ore-dressing plants and metallurgical works. Timber, by itself in a forest, costs nothing—or if it does, in artificial plantations, it is only the labour of planting and later care. It starts to cost money as soon as men have to cut it, transport it and eventually shape it. Explosives, flotation reagents and smelter fluxes are all free as the air in the natural state of their constituents, and only start to cost money when men put work into them.

It therefore seems to me irrefutable that if costs go up by 4 per cent a year then productivity in everything (not only our own mining products but everything) must go up by 4 per cent a year just to keep industry on a level keel.

## MINING MISCELLANY

Ferralloys Ltd., a new company in the Anglo-Vaal Group, is to build a £12,000,000 ferro-manganese plant shortly at Cato Ridge in Natal.

Fiska Verk, Kristiansand, Norway, is building a ferro-silicium furnace with 24,000 kVA. transformer capacity. This furnace will be the largest of its kind in the world.

Dustless drilling equipment must be introduced in all Czechoslovakian mines by July 1, according to a government measure passed last year. A dust-eliminating suction device will be introduced where a water stream cannot be used.

The American Smelting and Refining Company has informed the Bethlehem Copper Corporation that it is terminating the agreement under which it has explored and developed Bethlehem's copper prospect in Highland Valley, B.C. The Corporation's president said American Smelting had notified the Canadian company that it would withdraw completely. But his company would carry its programme forward either on its own or in association with others.

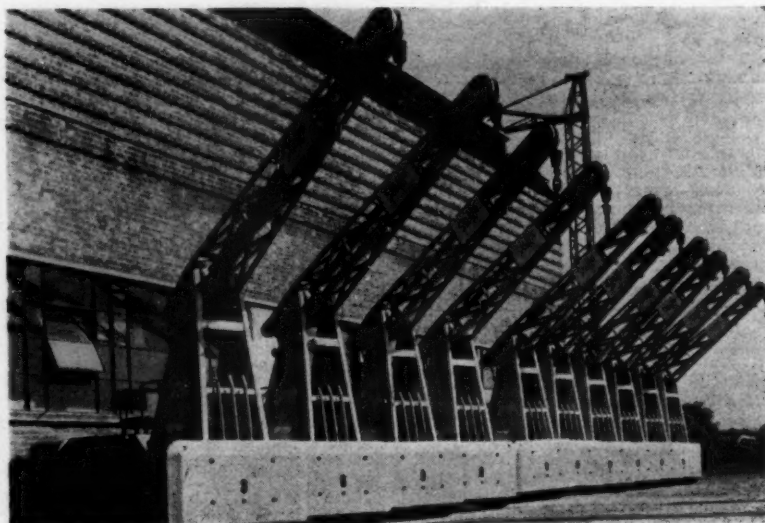
The Indonesian Cabinet has submitted to Parliament a previously approved Emergency Draft Bill on the withdrawal of mining concessions. Under the Bill, made up of six articles, mining concessions granted by the government prior to 1949 will be withdrawn if, until the Bill comes into force, no exploitation efforts have been made or commenced. Mining concession will only be granted by the government to mining enterprises belong-

ing to the State or to national enterprises in which national capitals are invested.

In our issue of April 18, 1958, it was stated that the first airborne exploration operation of a new area in West Africa using an airborne magnetometer was nearing completion in Sierra Leone. It has since been pointed out that Lundberg Explorations Ltd., of Toronto and Stockholm, made an airborne survey in Liberia for Liberian American-Swedish Minerals Ltd. in January and February of 1957. During the survey a magnetometer, a scintillometer, and a gradiometer were used simultaneously and five different areas were surveyed with good results.

The Government of India has, by an amendment to the Mineral Concession Rules, prohibited all transfer of mining lease, right, title or interest, without the previous consent in writing of the State Government. The measure is aimed at preventing speculation in mining properties. Any breach of the provision will be punishable with termination of the lease. Previously, transfer of lease in respect of some minerals was permissible with the "previous sanction" of the State Government. As regards minerals like coal, lignite, gypsum, rare earths, thorium, monazite, uranium, manganese, iron, copper, gold, and tin, the rule previously was that no transfer of mining right should take place "except with the previous approval of the Central Government". This provision remains unchanged in the amended rules. The net effect of the new rules will therefore be that changes in mining rights in future will take place only with the previous

The Chamberlain Group of Companies announces that one of its group directors, Mr. L. R. H. Bell, visited Spain for exhibiting the "Staffa 3" 3-ton capacity mobile crane (seen below) at the Valencia Fair from May 1 to 20. The crane was shown in co-operation with Impex S.A. and Henry W. Peabody and Co. of London Ltd. It is hoped that the crane will also be exhibited at the Barcelona Fair later in the year.





consent in writing of the State Government, and in regard to some specified minerals the State Governments will have to secure the approval of the Centre before they give their consent.

★  
Mr. H. J. Harris, the chief research officer, Research Division, Department of Mines, Malaya, has been lent by the Federation of Malaya to the Sarawak Government to advise on the development of that country's gold-mining industry. Mr. Harris arrived in Kuching on May 14. He will visit the gold mines of the Bau district, where he will examine the processes now in use for winning the ore containing gold and of extracting the gold from the ore. The gold ore in this district is complex. The gold occurs with antimony, iron and arsenic sulphides. The assistance of Mr. Harris has been requested because it is thought that by an application of new scientific knowledge to the old methods now in use, a substantial improvement in recoveries could be achieved. Mr. Harris is likely to spend about three weeks in Sarawak.

★  
The work of tunnelling Mont Blanc from the Italian side has been awarded to the Societa Condotta d'Acque, which has undertaken to complete its work by October 14, 1960. Work started this week. The Mont Blanc tunnel will be 11,700 metres long and will be 7 metres wide, plus two pavements on each side. The entrance on the Italian side will be at a height of 1,381 metres and the exit on the French side at 1,275 metres height. The cost of the work is estimated at about 12,000 million lire, of which 5,500 million lire have been provided by Italy, about 500 million lire by the Canton of Geneva and by the Municipality of Geneva, and 5,000 million lire by France.

#### PERSONAL

Mr. J. G. Gershon, sales director of Rocol Ltd., is in Canada for a fortnight's intensive tour to establish Rocol selling agents.

★  
Mr. F. R. Milliken and Mr. C. K. Lenz have been elected to the board of Kennecott Copper Corp.

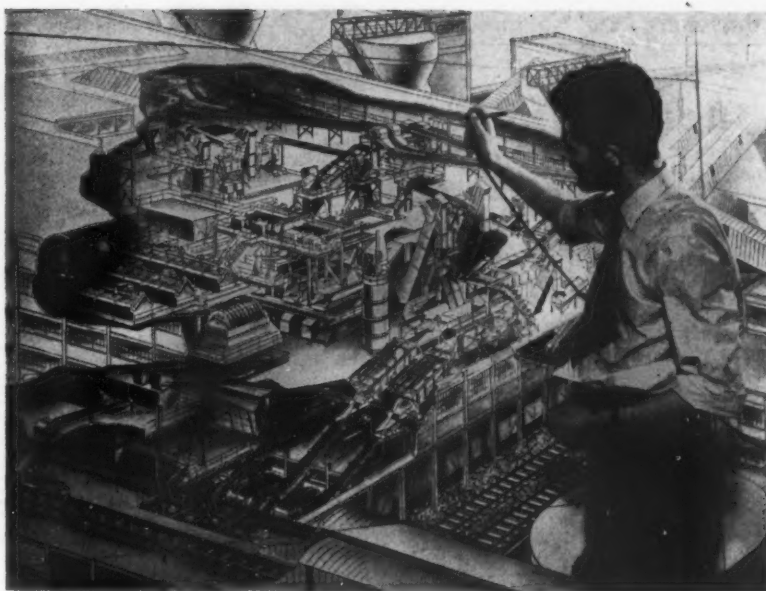
★  
Mr. J. F. Ince has joined the board of Falcon Mines.

★  
Mr. M. W. Parish has resigned his directorship of Nigel Finance and Investment Ltd.

★  
The summer meeting of The Institution of Mining Engineers is to be held in Birmingham from July 2 to July 4, 1958. The summer meeting of The Midland Counties Institution of Engineers is to be held on June 18 in Worcester. The North of England Institute of Mining and Mechanical Engineers will meet in Newcastle upon Tyne on August 8, 1958.

★  
The Gauge and Tool Exhibition closed on May 21, 1958. The exhibition opened on May 12 at the National Hall, Olympia.

★  
The Third Production Exhibition and Conference was held in the Grand Hall, Olympia, from May 12 to May 21. Exhibitors whose products are of interest to the mining industry were: British Electrical Development Association, Cementation (Nuffelite) Ltd., Climax Rock Drill and Engineering Co. Ltd., Ekco Electronics Ltd., Hunting Aircraft Ltd., Magnesium Elektron, The Mond Nickel Co.



An artist working on a drawing of the Manvers Main coal preparation plant, a third of which has been cut away to show the equipment. This picture was commissioned by Head Wrightson and Co. Ltd. for exhibition at Liege during the International Convention of Coal Preparation Plant Engineers

Ltd., Sandvik Swedish Steels Ltd., the Tin Research Institute, C. C. Wakefield and Co. Ltd., and the Zinc Alloy Die Casters Association.

#### CONTRACTS AND TENDERS

The International Co-operation Administration (I.C.A.) has announced the following future procurements.

##### Korea

Itemized spare parts for tractor, grader, crushing and screening plant, dump trucks, etc. Bids to Office of Supply, Government of the Republic of Korea, Seoul, Korea. Closing date, June 25, 1958. Ref. ESB/12725/58. Telephone inquiries to Chancery 4411, extension 354.

##### Burma

Sixteen centrifugal pumping sets at 50,000 g.p.h., 10 centrifugal pumping sets at 20,000 g.p.h., 6 diesel pumping sets at 50,000 g.p.h. 8 sets diesel at 20,000 g.p.h., and 10 sets diesel at 10,000 g.p.h. Bids to Director-General, Union of Burma Purchase Board, St. John's Road, Rangoon.

Closing date, June 9, 1958. Ref. ESB/12645/58. Telephone inquiries to Chancery 4411, extension 738 or 771.

##### Pakistan

Soil-sampling equipment, including rotary drill unit, hydraulic jacks, water jetting apparatus, driving heads, etc. Quotations as soon as possible to Prof. R. A. Foulkes, Government College of Engineering, Moghalpura, Lahore. Ref. ESB/12584/58. Telephone inquiries to Chancery 4411, extension 776 or 866.

##### Philippines

Radio transmitters and receivers, 2 core drills, complete rig, 11 centrifugal pumps of 20,000 g.p.h. minimum capacity, 3 centrifugal self-priming pumps of 40,000 g.p.h. capacity, and 2 centrifugal self-priming pumps of 240,000 g.p.h. capacity. Bids to Republic of the Philippines, National Economic Council, Office of Foreign Aid Co-ordination, Procurement Branch, Manila. Closing date, June 2, 1958. Ref. ESB/12462/58. Telephone inquiries to Chancery 4411, extension 354.

## Bruce Dunfield Leaves "M.J."

An informal reception was held by the directors of The Mining Journal Ltd. at the Palmerston Restaurant, Bishopsgate, E.C.2, on Friday of last week, in honour of Mr. R. Bruce Dunfield, who relinquishes his post as joint editor of *The Mining Journal* at the end of this month to join Sidney-Barton Ltd. Mr. U. Baliol Scott (managing director and joint editor) in proposing a toast to the guest of honour, paid tribute to the notable contribution he had made to the development of *The Mining Journal* in recent years, and wished him all success in the new field of activity upon which he had now chosen to embark. There could be, he said, few people better qualified than Bruce Dunfield, both by experience and still more by personality, for public re-

lations work in industry. There was tremendous scope for better public relations in industry generally, and by no means least in the mining industry.

Mr. Dunfield leaves to take up his new post with Sidney-Barton Ltd. on May 31. Consequent on his departure, editorial staff appointments on *The Mining Journal* will be as follows from June 1:

Editor: U. Baliol Scott (formerly joint editor).

Deputy Editor: A. Graham Thomson (formerly news editor).

Assistant Editor: Robert Bowran.

Assistant Financial Editor: Roger Nuttall.



## Machinery and Equipment

### Diamond Drilling Soft Formations

The introduction several years ago of the double-tube bottom-discharge (series M) type diamond drill core barrel solved a number of problems connected with core recovery in soft formations. Removal of the core from the core barrel, however, still presented a major difficulty, since some disturbance was inevitable with friable material, no matter how carefully this operation was undertaken.

In the summer of 1957, with this difficulty in mind, Triefus Pty. Ltd., the Australian associate of Triefus Industries Ltd., produced a split-core barrel. This equipment enables core logging to be completed before the core is disturbed, and its use in exploring the friable coal seams of New South Wales has so far been attended by remarkable success. In one instance, a vertical *open* fissure through coal was preserved.

Full-scale manufacture of the split barrel is expected to start in England within the next six months, although at first this design will be confined to the NX (2½ in. dia. core) range only.

A further development featured in Triefus diamond drilling equipment is a reaming shell incorporating diamond-studded strips shaped spirally in a manner analogous to the blades of an axial flow pump. Tests on this equipment, it is claimed, have proved that this pumping action increases penetration rate by over 25 per cent and minimizes grinding of the core by removing sludge quickly from the end of the hole.

#### U.K. EQUIPMENT FOR TRACTORS

A heavy-duty engine-mounted front pusher-plate assembly for the Allis-Chalmers HD 21 tractor is now being manufactured by Mackay Industrial Equipment Ltd., the sole concessionaires in the United Kingdom for all Allis-Chalmers industrial earth-moving equipment.



The pusher-plate, made to factory drawings, is ruggedly constructed in 1 in. to 1½ in. thick steel box section (inset) and weighs approximately 2,160 lb. It fully protects the tractor and enables the great power of the HD21 to be transmitted accurately to the pusher "button" of the scraper. It also obviates the possibility of damage to the scraper tyres.

Two-position vertical height adjustment is provided and the special pin-connected links enable a speedy change of position to be made.

An Allis-Chalmers HD.21 fitted with the new pusher-plate operating at Fair Mill opencast coal site at Swillington. Inset photograph shows the honeycomb construction of the pusher-plate and the method of linkage

#### RADIOACTIVITY WITHIN REASON

Produced under licence from the U.K. Atomic Energy Authority, a geiger counter costing £10 is being manufactured by Radiation Monitors Ltd. The counter is a self-contained light-weight portable instrument that can perform many of the routine tasks of contamination detection, isotope tracing, or qualitative measurement required in laboratories, industrial premises, or other establishments where radioactive substances are present.

The Utility Counter employs a highly sensitive low-voltage halogen-quenched tube in a simple integrator circuit deve-

loped from that evolved at the Atomic Weapons Research Establishment, and provides three ranges of visual and audible response.

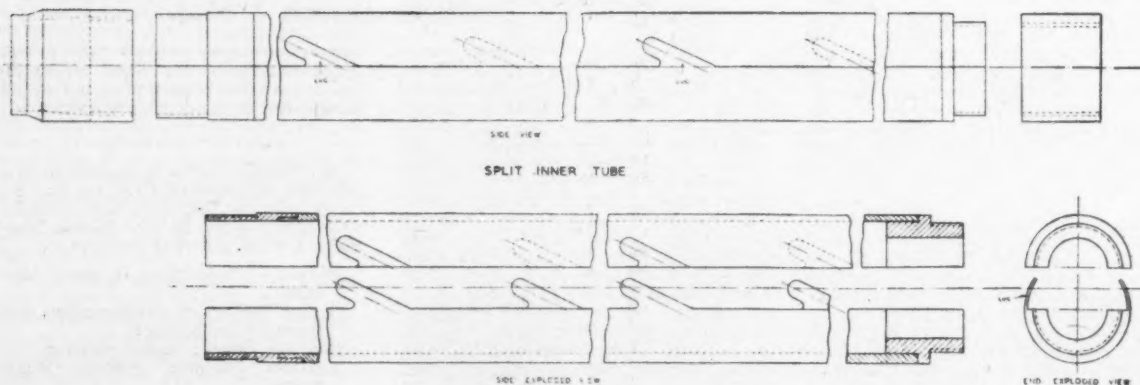
Designed primarily for reasonably accurate monitoring on the high range, with a loudspeaker count of each single ionizing event on the low range, the Utility Counter has also a medium range which is of considerable facility for quick measurement.

By switching through the ranges, increasing radiation shows as a clearly discernible increase in the rate of flashing up to levels of 20,000 counts per minute without timing; stop-watch comparisons of the time for ten flashes extending this until the onset of saturation at values approaching twice this level.

CORE LIFTER  
ADAPTOR

SPLIT INNER TUBE ASSEMBLY

TOP COUPLING



**Metals and Minerals****The Incidence of Tin Restriction**

Speaking to shareholders of the Straits Trading Company in Singapore last week, the chairman, Sir Ewen Fergusson, made some reference to the matter of equality of sacrifice among tin-producing countries under the quota scheme. His speech is reported in full on page 614.

The extent to which countries such as Nigeria and Thailand have suffered disproportionately to other countries in respect of the percentage cutbacks they have suffered on their 1957 level of production is already common knowledge, as is the fact that the cutback in Bolivia is no more than half as big as in these two countries. Percentage cutbacks, however, tend to obscure the actual tonnages involved, and Sir Ewen Fergusson's comments on the extent to which Malaya's present production capacity may be overestimated in her assessment under the Tin Agreement emphasizes the extent to which a relatively small percentage error in respect of a large producer can have a correspondingly large impact on the picture as a whole.

Sir Ewen considers that today a realistic estimate of Malaya's maximum production capacity is around 60,000 tons compared with the present assessment for that country of 68,000 tons. He goes on to remark that "the excess of assessments over true ability to produce, with its ferment of export rights on non-existent production, is an artificiality which at 12 per cent over full production seems too high to be perpetuated". Nevertheless, as he points out, it will take time to readjust quotas, more especially as under Article VII of the Tin Agreement, only one-twentieth of the percentages of the participating producing countries become available for re-allocation each year. Moreover, at a time when world tin production capacity seems to be on the decline, it by no means follows that Malaya is the only producing country with an artificially high assessment, and it would be interesting to hear some Bolivian authority make calculations for that country similar to those which Sir Ewen Fergusson made for Malaya last week.

As regards the future level of quotas, Sir Ewen clearly expects that, once the present heavy production cutbacks have been maintained long enough to run down the present buffer stock holdings to a more reasonable level, it will still be necessary to hold production at around 130,000 tons per year, which would imply an overall cutback of some 16 per cent of the pre-quota rate of production compared with present quota cuts of 40 per cent. These figures presumably presuppose the continuation of Russian exports at or above last year's level.

Sir Ewen also performed a useful service in his address by emphasizing the apparent neglect, by the buffer stock manager, of the forward L.M.E. price in his buying operations. The result, as he points out, has been that considerable amounts of tin were bought forward by various operators and profitably resold to the buffer stock on a spot-price basis. The forward price has thus tended to remain artificially depressed and producers have suffered accordingly.

**RHODESIAN CHROME PRICES DOWN**

Last Tuesday, Rhodesian chrome producers announced reductions in their contract prices ranging from £1-£2 per ton according to grade. Prices now ruling for typical grades are shown in this week's price table. It must be assumed that these price reductions have been dictated by price cutting by producers elsewhere rather than by any great expectation that such cuts could at the moment appreciably stimulate purchasing. Chrome is so closely linked to the steel industry that any substantial revival in this market must await a revival in demand for steel and ferro-chrome.

As has happened with other metals, slacker buying conditions have coincided with expanding production. In Rhodesia and South Africa alone, production of chrome metal increased by around 100,000 tons last year with the prospect of further large expansions in the next year or so, although there have since been reports of some temporary shut-downs in both countries.

The immediate outlook has not been assisted by reports from New York this week that a new chrome barter deal with Turkey may be imminent.

**NOW THERE OUGHT TO BE ENOUGH**

In a survey published this week entitled "The Supply of Nickel, 1958-61", the International Nickel Company discloses that nickel stocks in North America at the end of last month were equivalent to more than six months' consumption at last year's rate. The company estimates these stocks at 72,000 s.tons exclusive of metal in the United States Government stockpile. This information serves to underline the urgency, in the short term, of the two successive cutbacks in production totalling 20 per cent, which Inco has made during recent weeks. It will be recalled that when announcing the second of these two cuts on April 23, the company pointed out that, even at the consequentially reduced rate of production of 125,000 s.tons of nickel a year, it was expected that its stocks would continue to rise, as orders were currently below this level.

The survey also stresses that Free World production capacity of nickel in 1958 should be about 262,500 s.tons (actual output in 1957 was 245,000 s.tons), rising progressively to 325,000 s.tons by 1961. There seems to be little doubt that, now that the shortage of nickel is at last at an end, Inco is quite as concerned about ensuring uninterrupted availability of nickel in the future as it is with the immediately somewhat discouraging picture. In this connection, it is perhaps significant that the company has so far been surprisingly unhurried in putting into effect the kind of energetic sales offensive which first the aluminium and then the copper producers have been promoting, and it is a fair guess that this far-sighted organization does not wish to stimulate demand

among new users at a higher rate than it feels it can cope with on the crest of the next market recovery. Even so, the Free World has got to be persuaded between now and 1961 to absorb over 50 per cent more nickel than it is currently consuming if full production is to be sustained.

**DE-STOCKING PLATINUM**

Yet another example of de-stocking in the States emerges from the U.S. Bureau of Mines platinum statistics for last year. These indicate that while total imports of platinum-group metals in 1957 were about 34 per cent down on those of 1956, yet sales to consumers were only about 17 per cent lower. A breakdown of this latter figure gives sales of platinum as down by 20 per cent, of palladium as down by 15 per cent and of the other platinum-group metals as down by 1 per cent.

Sales of platinum in the fourth quarter of the year are estimated at approximately 79,600 oz. compared with 81,500 oz. in the third quarter and 117,700 oz. in the fourth quarter of 1956. Refiners' and dealers' stocks rose "moderately" in the fourth quarter.

Sales of palladium in the fourth quarter of 1957 are estimated at 64,100 oz. compared with 57,800 oz. in the third quarter and 95,100 oz. in the fourth quarter of 1956. Stocks decreased "moderately".

The price movements of recent weeks (discussed here fully last week) seem to indicate that figures for the early months of this year will show a further deterioration.

**HOW LONG IS A PIECE OF STRING?**

Brazil shows signs of consolidating the position she gained last year as the world's premier exporter of manganese ore, with total shipments of 820,000 tonnes, of which just under 50 per cent went to the United States. Despite the slump in the American steel industry, Brazilian exports for 1958 are reported already to be fully sold (in part to the United States stockpile).

It is regrettable to observe that the Chilean habit of issuing statements about "production up to the end of the year being fully sold" is now spreading to other South American countries. Such statements unaccompanied by figures of actual tonnages sold can be confusing, as is well illustrated by the case of Brazilian manganese.

Thus earlier dispatches had indicated that Brazilian manganese production in 1958 was not expected to exceed about 75 per cent of last year's exports, and the picture is made no clearer by a statement in the March issue of the Brazilian *Conjuntura Economica* to the effect that the United States Government has a commitment with the Export-Import Bank to purchase all Brazil's excess manganese production up to a total of \$67,500,000—a process which is apparently expected to take about six years.

# COPPER • TIN • LEAD • ZINC

(From Our London Metal Exchange Correspondent)

The undertone of all markets has remained surprisingly good and price movements have been very small. The main item of news during the week has been the settlement of the strike at Chuquicamata, but this had very little effect on prices and the majority opinion now is that the copper price will remain around its present level well into the summer. Stocks in the U.K. showed another reduction of 1,125 tons, reflecting further shipments to America, where it is still possible from time to time to undersell customs smelters.

## AID FOR AUSTRALIAN COPPER

The low price of copper continues to make various governments produce plans for helping the mining industry in their various countries and the latest example is Australia, where the price of copper is to be maintained at £A330 by the imposition of a tariff of £1 per ton for every £1 the London Metal Exchange quotation falls below the equivalent of £A275 plus a bounty of £A45 per ton. It is estimated that the normal import c.i.f. quotation for copper is about £A10 above the London quotation.

The U.S. Copper Institute gives the production of crude copper in the U.S. during April at 97,390 s.tons compared with 98,934 in March and production of

refined copper totalled 120,467 against 130,075. Domestic deliveries during the month were slightly better but in spite of this stocks of refined copper rose from 238,641 to 251,099 s.tons.

Production outside the U.S. fell by approximately 23,000 tons from the March figure to reach 106,616. Production of crude copper fell by the even greater tonnage of 28,000 tons at a total of 129,592 and, in spite of deliveries falling off by about 22,000 tons, stocks at the end of the month were some 4,000 tons lower at 250,401. Further figures issued in respect of 1957 show that the copper consumption in that country dropped 11 per cent over the tonnage consumed in 1956 and that this decline was shared by all the various consuming groups.

## TIN WAITS ON AMERICA

The tin market has remained very near the support level but it may be that the market is shortly going to attempt another upward movement although, as has been said before, it is only increased buying in America which will fundamentally alter the picture. Some reports speak of more interest from that quarter, but it seems unlikely that any major buying wave is likely to develop in the immediate future.

Stocks in official warehouses remained almost stationary at 18,462 tons and this seems to agree with the opinion expressed in the market that the buffer stock manager has only had to buy very small tonnages of tin, even though the quotation has almost always showed him to be the buyer. Tin shipments from Singapore in the first half of May were 503 tons compared with 284 tons for the first half of April, but even so are a little more than half of the tonnage shipped during the same period last year. Shipments from Penang totalled 1,027 tons which is some 600 tons lower than during the first half of April and 400 tons less than the corresponding period last year. On Thursday morning the Eastern price was equivalent to £746½ per ton c.i.f. Europe.

## LEAD PRICE CUT

Almost before the ink was dry on last week's report the expected drop in the lead price occurred with a reduction to 11½ c. per lb. New York. Reports indicate that this reduction has not enabled American sellers to compete with imported material, and some quarters consider that a further reduction of ½ c. per lb. is inevitable.

The situation in the zinc market remains unaltered, but a reduction in price in that metal also would not be unexpected. Nothing has occurred to disturb the tranquility of the London markets for the two metals and the majority opinion is that whereas lead may slide back a few pounds, the price of zinc is unlikely to follow to any large extent.

## LONDON METAL AND ORE PRICES, MAY 22, 1958

### METAL PRICES

Aluminium, 99.5% £180 per ton	Iridium, £22 oz. nom.
Antimony—	Lanthanum (98/99%) 15s. per gram.
English (99%) delivered, 10 cwt. and over £190 per ton	Manganese Metal (96% - 98%) £310
Crude (70%) £190 per ton	Magnesium, 2s. 3½d. lb.
Ore (60%) basis 19s. 6d./20s. 6d. nom per unit, c.i.f.	Nickel, 99.5% (home trade) £600 per ton
Arsenic, £400 per ton	Osmium, £18/£20 oz.
Bismuth (min. 1 ton lots) 16s. lb. nom.	Osmiridium, nom.
Cadmium 10s. 0d. lb.	Palladium, £6 5s./£6 15s.
Cerium (99% net), £16 0s. lb. delivered U.K.	Platinum U.K. and Empire Refined £24/£25 oz. Imported £22/£22 10s.
Chromium, Cr. 99% 7s. 2d. lb.	Quicksilver, £76 10s. ex-warehouse nom.
Cobalt, 16s. lb.	Rhodium, £40/£42 oz.
Germanium, 99.99%, Ge. kilo lots 2s. 8d. per gram	Ruthenium, £15/£17 oz. nom.
Gold, 249s. 5d.	Selenium, 50s. 0d. per lb.
	Silver, 76½d. f. oz. spot and 75½d. f.d.
	Tellurium, 14s./15s. lb.

### ORES AND OXIDES

Bismuth .. .. .	65% 8s. 6d. lb. c.i.f.
Chromite—	18-20% 1s. 3d. lb. c.i.f.
Rhodesian Metallurgical (semifriable) 48%	£16 5s. 0d. per ton c.i.f.
" Hard Lumpy 45%	£16 0s. 0d. per ton c.i.f.
" Refractory 40%	£11 10s. 0d. per ton c.i.f.
" Smalls 44%	£14 10s. 0d. per ton c.i.f.
Baluchistan 48%	£11 15s. 0d. per ton f.o.b.
Columbite .65% combined oxides, high grade	nom.
Fluorspar—	
Acid Grade, Flotated Material	£22 13s. 3d. per ton ex. works
Metallurgical (75/80% CaF <sub>2</sub> )	156s. 0d. ex works
Lithium Ore—	
Petalite min. 3½% Li <sub>2</sub> O	47s. 6d./52s. 6d. per unit f.o.b. Beira
Lepidolite min. 3½% Li <sub>2</sub> O	47s. 6d./52s. 6d. per unit f.o.b. Beira
Amblygonite basis 7% Li <sub>2</sub> O	£26 5s. per ton f.o.b. Beira
Magnesite, ground calcined	£28 0s./£30 0s. d/d
Magnesite Raw (ground)	£21 0s./£22 0s. d/d
Manganese Ore Indian—	
Europe (46% - 48%) basis 67s. 6d. freight	nom.
Manganese Ore (43% - 45%)	nom.
Manganese Ore (38% - 40%)	nom.
Molybdenite (85% basis)	8s. 5d. per lb. (f.o.b.)
Titanium Ore—	
Rutile 95/97% TiO <sub>2</sub> (prompt delivery)	£37/£38 per ton c.i.f. Aust'n
Ilmenite 52/54% TiO <sub>2</sub>	£11 10s. per ton c.i.f. Malayan
Wolfram and Scheelite (65%)	£2s. 0d./£2s. 0d. per unit c.i.f.
Vanadium—	
Fluoride oxide 90 - 95% V <sub>2</sub> O <sub>5</sub>	£10 per unit c.i.f.
Zircon Sand (Australian) (65 - 66% ZrO <sub>2</sub> )	£14 5s. per ton c.i.f.

## U.K. STATISTICS FOR MARCH

The British Bureau of Non-Ferrous Metals Statistics have issued their figures for March, 1958, which show that consumption of copper was 53,071 tons against 51,559 tons in February, while stocks of refined and blister copper at the end of the month amounted to 94,330 against 89,147 tons a month earlier. Consumption of tin was practically unchanged at 1,566 tons while stocks at the end of March showed a decline of about 500 tons at 19,824. The total off-take of lead increased by almost 2,000 tons as compared with February to 29,713 and stocks were some 7,000 tons lower at 40,547. The off-take of zinc also increased by some 2,500 tons at 26,967 but stocks showed only an infinitesimal decrease at 46,608 against 46,662 tons at the end of February.

Closing prices are as follows:

	May 15		May 22	
	Buyers	Sellers	Buyers	Sellers
<b>COPPER</b>				
Cash .. .. .	£176½	£177	£178½	£178½
Three months ..	£178½	£178½	£180½	£181
Settlement ..	£177		£178½	
Week's turnover	5,375 tons		6,875 tons	
<b>LEAD</b>				
Current ½ month	£72	£72½	£71½	£71½
Three months ..	£72½	£72½	£72½	£72½
Week's turnover	3,275 tons		2,275 tons	
<b>TIN</b>				
Cash .. .. .	£730	£730½	£730	£730½
Three months ..	£733	£733½	£733	£733½
Settlement ..	£730½		£730½	
Week's turnover	675 tons		925 tons	
<b>ZINC</b>				
Current ½ month	£61½	£61½	£61½	£61½
Three months ..	£61½	£62	£62	£62½
Week's turnover	8,050 tons		3,475 tons	



## Mining Finance

## It All Depends What You Mean by Ultra-Deep

Quite the most interesting news to come from the chairmen of the various companies of the Central Mining group (whose statements appear on p. 611) concerns East Rand Proprietary Mines' operations at depth.

On the 70th level (which is being driven approximately on the 9,700-ft. horizon) the sampling of 3,150 ft. in 1957 gave average values of 477 in. dwt. for the payable 72 per cent—encouraging figures—while of the 6,900 ft. sampled on this level since work began, 4,880 ft. have proved payable at an average of 487 in. dwt. As Mr. Anderson points out, however, operations at such depths are expensive, both with regard to initial capital and working costs. Shaft sinking and other works are nevertheless going

ahead. Coming on top of the paragraph in the annual report, which reveals that certain sections of the reduction plants are rapidly becoming obsolescent, this news must make shareholders begin to wonder if E.R.P.M.'s heavy capital expenditure (estimated at £650,000 for 1958) will ever slow down.

The unknown factor which intimately concerns E.R.P.M.'s deep-level programme is fiscal policy. In effect, the company is opening up a completely new mine at depth, south-east of the present workings. Yet, in terms of present legislation, East Rand Proprietary will qualify neither for the favourable write-off concessions accorded to new mines (because milling began in 1908), nor for the even more favourable treatment accorded to

Western Deep Levels (because E.R.P.M. as a whole is not an ultra-deep-level operation). Mr. Anderson ends his remarks on this subject by saying that in the light of the most up-to-date information, special consideration is being given to the long-term programme with particular reference to the amount of capital expenditure involved. Whether "special consideration" includes representations to the taxation authorities is not known, but there would certainly appear to be a case.

## MODDER B WIND-UP OPPOSED

Another Central Mining company in the news at the moment is Modder B., certain of whose shareholders have formed an association with the object of defeating the liquidation proposals to be made at the annual meeting. Their case, apparently, is that such a liquidation would result in forced sales. In view of the fact that several mines whose operations stopped as long ago as 1953 are still making liquidation distributions from property sales as and when the opportunity arises, the argument seems somewhat wide of the mark.

## THE PRICE OF (SOUTH AFRICAN) COAL

Where, as in South Africa, coal prices are determined, not by supply and demand, but by government, it is government's responsibility to ensure that the balance between the interest of the community and the more special interest of the shareholders is held fairly. This is not a question of political morality, but one of economic commonsense, more especially in a country such as the Union, where, in contrast to the world picture, production is not tending to outstrip demand. If the price is fixed too low, the only buttress against an eventual major fuel shortage is the public conscience of the colliery owners, who, aware of the fact that theirs is an industry of fundamental importance, continue to produce however difficult the circumstances.

In his address to shareholders of Vereeniging Estates, a company which controls something like 30 per cent of the Union's total output, Mr. T. Coulter, the chairman, points out that after taxation, amortization and current capital spending, the capital employed in the S.A. coal industry yields only fractionally more than that obtainable from fixed investments. The balance, in fact, is not being fairly held.

The significance of this at the present time is particularly apparent with regard to labour. Competition for labour and, in particular for African labour, is most severe in the Union, and collieries, no less than gold mines, are at a disadvantage when faced with the shorter hours and higher wages of light industry, while the supply of imported labour is threatened at its source by growing industrialization outside the Union.

The answer, obviously, lies in mechanization.

## LONDON MARKET HIGHLIGHTS

South African gold shares have burst into prominence during the past week in no uncertain manner. The upward movement which had had its beginnings in the previous week spread quickly from the shares of the older gold producers to the newest mines and the market advanced on a broad front. In the same way, interest which had at first been largely professional began to acquire a wider aspect and the daily number of bargains marked soared to the highest recorded since September, 1954.

For some time past the gold share market has been acting rather like a tethered balloon—unable to rise, but equally unlikely to descend. Something was needed to cut the tethering rope and there was no doubt that what sent the balloon up last week was the advent of U.S. buying of gold shares, both here and in New York. United States interest in London centred on Crown (29s.) and Consolidated Main Reef (18s. 9d.), both of which rose substantially. In New York, Homestake rose \$2 to \$44½ and buyers were about for McIntyre Porcupine, too.

Any revival of U.S. interest in gold shares is naturally enough associated these days with talk of a higher U.S. price for gold—rumours to this effect were reported to be circulating on Wall Street last week—but the feeling in London was that although such a readjustment was possible, nobody expected any immediate developments. Even so, those who already held gold shares—usually at prices well above the current levels—saw no point in selling while prices were on the upgrade. Buyers, on the other hand, were taking the view that apart from the good dividend income available in so many cases, there was a good chance of capital appreciation. It was argued that so long as an increase in the gold price remained a possibility—though perhaps hardly a probability—gold-share prices would remain quickly responsive to the periodic resurgence of these hopes.

London took the lead in last week's

share market revival; the Cape was content merely to follow, and strangely enough, in view of the political crisis, French buyers did not indulge to much extent in their traditional gold share hedging operations usually seen in times of domestic upheaval.

Some of the more outstanding rises were seen in Durban Deep, up 4s. to 32s., Modder East, 1s. 9d. to 15s. 9d.; West Wits, 3s. to 45s., and President Brand, 4s. 3d. to 52s. 3d. Finance shares moved up sharply, despite the fact that in many cases higher earnings from gold holdings must be offset to some extent by the fall in base metal share income. Rises in this group included Anglo American, up 8s. 9d. to 135s., and Rand Mines, 5s. higher at 80s. Other gold shares than Kaffirs also came in the picture to a limited extent, Ashanti being notable with a rise to their best this year of 16s.

While Kaffirs were shining, base metal share markets were almost completely ignored, and since such news as there was in these sections turned out to be rather dismal, this was probably just as well. In Coppers, for example, the sharply reduced interim from Roan had been more or less expected, but few even of the most pessimistic observers had been prepared for the still more severe cut in the R.S.T. interim payment. In the event, the shares behaved fairly well, and although they dropped from 15s. 4½d. to 14s. 6d., they later rallied with a brighter tendency on Wall Street to 15s. 3d.

Tins and lead-zincs moved narrowly if somewhat dispiritedly, Consolidated Zinc being a dull spot at 44s. Elsewhere, dealings began in Tweefontein United Collieries, and on consideration of their generous yield for this class of share, they soon rose to 41s. 1½d. from the opening price of 38s. 6d.

As we go to press the news of the reduction in Bank Rate to 5½ per cent appeared to be taking some of the steam out of the Kaffir boomlet. The effect on other sections of the market appeared to be negligible.

zation. Mechanization, however, needs money (especially in the Union, where much capital equipment has to be imported over great distances) and money, or capital, can only be attracted by good interest. To quote Mr. Coulter, the responsibility of the coal industry to the community can only be carried out satisfactorily if "the industry is permitted to maintain a sound economic price structure, compatible with the capital requirements of constantly expanding production".

#### MOUNT ISA FAILS THE MEANS TEST

The terms of the copper bounty to be paid by the Commonwealth Government appear to place Mount Isa, Australia's largest producer, in an invidious position. Apparently a company is only allowed to apply for the bounty (of £A45 per ton) if the capital employed in the operation shows a return of less than 10 per cent. Mount Isa's assets earn more than this arbitrary figure, and the company is thus disqualified from application.

Since the bounty will only apply to sales to the Australian market, and all but 40 per cent of Mount Isa's copper goes overseas, the loss to the company is not as large as would appear at first sight. Nevertheless, such a distinction between the "needy" and the "prosperous" seems to set a premium on inefficiency, more especially when the line is drawn by reference to balance-sheet earnings based, as often they are, on historical rather than replacement cost.

Meanwhile, stages one and two of Mount Isa's £2,000,000 expansion programme are being pressed ahead, and the first tangible results are beginning to appear. In the April four-week period, ore throughput was up by 1,300 tons daily to an average of 5,300 tons per day, well above the target for stage one. Metal output increased roughly in proportion. Costs at the mine are moving in the opposite direction, partly as a consequence of the economies from higher production and partly because of the fall in the lead bonus paid to employees, which, at £4 10s. per week in March, was at its lowest level since the war, comparing with a high point of over £17 weekly for a time in the post-Korean boom.

At around 21s., Mount Isa 5s. stock units are a not unattractive lock-up—not least for those who take an optimistic view of the duration of American economic troubles.

#### MINERALIZATION PATTERN AT RIEBEECK

Riebeeck Gold Mining, the company formed to exploit the V.S. (or "Rainbow") reefs occurring in the Van den Heversrust area of the Orange Free State goldfield, this week announced a reef intersection of 661 in. dwt. in a borehole drilled vertically upwards from the haulage advanced into Riebeeck by the neighbouring Loraine company.

The borehole, sited 1,150 ft. south of the common boundary, is the first in the north-western corner of the mine to show any results at all on the Rainbow reefs, although two holes in the area gave assays of the order of 20-90 in. dwt. in Basal Reef intersections. Riebeeck, it will be remembered, is only allowed to mine

the lower reefs (including the Basal) should it prove impossible to establish a "satisfactory mine" on the V.S. reefs.

This latest result would appear to confirm the suspected pattern of mineralization over the Riebeeck property. The zone of payable Rainbow reef comprises a long narrow strip near the western boundary of the mine, and may be considered to be more in the nature of a lenticular orebody rather than the thin reef usually encountered in gold mining. Values in two sets of three boreholes straddling the orebody further south have already indicated the existence of a line of enrichment running roughly NNW-SSE, through the centre of the payable area, and the significance of the latest result lies not in the value exposed, good as it was, but in its indication that this line extends into the extreme NW. sector of the property between the two barren drillholes mentioned above.

The haulage from Loraine appears to have followed the approximate line of enrichment, and the new result may be no more than the first of a series. With Riebeeck standing at around 10s. 6d., and the Kaifir market in a receptive mood, the shares have speculative interest for those who enjoy betting on boreholes.

#### HENDERSON'S GOOD RESULTS

After the disappointment caused by the placing of a large Escom contract with an Afrikaner company, and not, as had been hoped, with Tweefontein Colliery, shareholders of Henderson's Transvaal Estates will be more than pleased with the preliminary results announced for the year to March 31, 1958.

In spite of an increased taxation charge of £146,893, net profit attributable to Henderson's after all charges (including taxation) came out at £132,860, an increase of £55,000 on last year's £77,156. The dividend recommended remains unchanged at 15 per cent, while the amount placed to reserve is £36,743, virtually the same as in 1957.

It seems probable that this expansion in earnings is due in part to the expansion of operations at Tweefontein, but possibly more to Henderson's large stake in the cement industry. For many years Henderson's has held a substantial investment in the unquoted Whites S.A. Cement Co., and in 1956 this latter company took a substantial participation in a new Rhodesian cement flotation, which began production last year. Whether, in fact, cement was the main contributory to Henderson's better earnings must await the annual meeting on July 10 for confirmation.

#### STRAITS TRADING CLOSES TWO MINES

Two mines under the control of the Straits Trading Co., Karak and Laboo, have been closed down. At Laboo, underground exploration and development have failed to disclose the second continuous orebody inferred from pre-war drilling, while abandonment of Karak was necessitated by the excessive cost of road deviation. The joint operation with Renong Tin in the Jinjang area is, however, progressing satisfactorily.

The chairman, Sir Ewen Fergusson, whose address to shareholders is reported elsewhere, also discussed some of the implications of tin restriction for Malaya.

These are examined this week in our Metals and Minerals feature.

#### 1958 MINING YEAR-BOOK

"The standard reference work on world mining companies" is the claim made for Walter E. Skinner's *Mining Year Book*. This statement is fully justified. Covering more than 940 companies, this traditional publication is indispensable to anyone connected with the world mining industry as miner, investor, or engineer.

The new 1958 edition follows the well-tried formula. Complete and up-to-date particulars of individual mining companies occupy the major part of the volume, while equally useful features such as a buyer's guide, gold and base metal production tables, and a list of over 1,000 mining engineers and managers are also incorporated.

*Mining Year Book* is obtainable from Walter E. Skinner, 20 Copthall Avenue, E.C.2, or from the *Financial Times*, 72 Coleman Street, E.C.2. The price is £2 2s. 6d. net post free (home and abroad).

#### Financial News and Results

**New Messina Subsidiary.**—The Messina (Rhodesia) Development Co. has been formed by Messina (Transvaal) Development Co. to take over certain management and other responsibilities in S. Rhodesia previously handled by the parent company.

**Copper Interims.**—As foreshadowed in these columns, the reductions in the R.S.T. group interims were very severe. Declarations were as follows: R.S.T., 1d., compared with an interim of 8d. and a total of 2s. last year; Mufulira, 8d., compared with 3s. 3d. and 9s. 9d.; and Roan Antelope, 1d., compared with 6d. and 1s. 6d. (All dividends mentioned are quoted before Rhodesian tax.)

**Mount Charlotte Acquisition.**—Mount Charlotte Investments announce that their recent offer for the capital of Mount Malcolm Gold, a small investment and finance company, was successful, acceptances having been received in respect of almost 94 per cent of Mount Malcolm's shares. The remaining 6 per cent will be acquired under the 1948 Companies Act.

**Rustenburg Reorganization Now Complete.**—Output at Rustenburg Platinum Mines is now running at a level somewhat less than the estimated sales for this year (50 per cent of last year's figure) in order to reduce the stocks accumulated during last year's period of acute oversupply. In announcing this, the company says that future dividend declarations will be made after the close of the financial year, and not in August as has been the practice hitherto.

**Corrigenda** — "M.J. Annual Review, 1958".—In the article on Rhodesian Anglo American, mining rights over 20 areas of 300 acres and one of 2,500 sq. miles are erroneously attributed to Kansashi Copper. In fact, these rights are owned by the Rhodesia-Katanga Co., subject to a 15 per cent interest held by Chartered.

A profits summary for Henderson's Transvaal Estates gives the item "Dividends and Sundries" for 1955 as £737,700. This should be £73,700.



# THE CENTRAL MINING — RAND MINES GROUP

Extracts from Chairmen's Statements circulated to Shareholders

(After the Annual General Meetings have been held, reports of the proceedings will be made available on request to the London Secretaries—A. Moir & Co., Ltd., 4 London Wall Buildings, London, E.C.2.)

## RAND MINES, LIMITED

(Incorporated in the Union of South Africa)

The following is an extract from the statement by the Chairman, **Mr. W. M. Frames**, circulated in advance of the Ordinary General Meeting of Shareholders to be held on May 30 in Johannesburg.

### GROUP REORGANIZATION

You will have noted in the Annual Report the details of the changes that have been made in the Central Mining—Rand Mines Group organization, and will probably recollect the Press announcement of August 13 last in this connection. From September 1, 1957, Rand Mines has rendered executive, administrative and technical services to the South African Companies of the Group. The transfer to Rand Mines Limited of the Technical Departments previously under the administration of Central Mining Finance Limited in South Africa was effected smoothly.

### CAPITAL

Details are given in the Directors' Report of the recent issue of 700,000 Reserve Shares. The net proceeds of the issue amounted to £2,344,395. Of this amount £1,000,000 has been lent to Harmony Gold Mining Company Limited towards financing the expansion of that Company's operations. Before the end of the year £250,000 had been advanced and the balance will be drawn by July 31, 1958. This loan is repayable in four half-yearly instalments of £250,000, commencing on June 30, 1960. Of the balance, a portion has been used to increase investments in mining, financial and industrial Companies in South Africa, and a substantial amount is held in liquid form and is available for employment in any proposition which offers promise of a favourable return.

### FINANCIAL RESULTS AND INVESTMENTS

The profit of £768,910 showed little change as compared with that of the previous year. After taking into account £427,504 being the balance of Profit and Loss Account at December 31, 1956, £1,196,414 was available for appropriation. Dividends absorbed £723,411 and £40,000 was transferred to Exploration Reserve, leaving the balance of Profit and Loss Account at £433,003 to be carried forward to 1958. Quoted investments were taken into account at cost less amounts written off, but in no case above market value at December 31, 1957. Unquoted shares were valued at cost or at a conservative valuation, being less than cost, by the Directors. Owing to a fall in the Stock Exchange value of some of the quoted securities and a revised valuation of some of the unquoted securities, it was necessary to depreciate certain investments by a total amount of £308,634.

After allowing for this depreciation and the investment of net additional funds of over £500,000, the total book value of investments increased by £223,149 to £8,328,684. The market value of the Company's quoted investments in-

creased by £1,012,355 to £10,593,027. Of these quoted investments three-quarters are in gold and coal mines, 85 per cent of which have a life expectation in excess of 20 years. The net cash surplus at the end of the year was £1,901,623, an increase of £1,515,658 over the previous year, resulting from the increase of capital towards the end of the year.

### ASSOCIATED COMPANIES

**Gold Mining:** Compared with the previous year, the tonnage milled by the Witwatersrand and Orange Free State mines of the Group in 1957, decreased by 1,284,036 tons to 15,961,396 tons, owing mainly to the cessation of milling by Modderfontein B. Gold Mines Limited, New Modderfontein Gold Mining Company Limited, and Welgedacht Exploration Company Limited, and the curtailment of operations by Crown Mines Limited. Although the yield at 4,378 dwt. increased by 0.172 dwt., the total ounces fine recovered fell from 3,627,110 to 3,493,697. Working profits from gold at £10,277,500 were £407,409 less than the year before, while the profits from uranium increased by £680,347 to £2,967,008. Total dividends and repayments of capital increased from £5,051,801 to £5,490,676. Tax and lease consideration increased by £464,205 to £4,331,588, and uranium loan repayments, including interest, decreased by £4,950 to £919,254.

Development footage decreased by 75,677 feet to 335,557 feet, the footage sampled at 154,290 feet being 66,050 feet less than the year before. Estimated available ore reserves decreased by 3,095,000 tons to 29,039,000 tons.

**Coal Mining:** The demand for coal in the inland market continues to be greater than the supply owing to transport limitations and to a shortage of non-European employees. As I pointed out in my address last year, increased mechanization is being undertaken in some cases to offset the labour shortage. Despatches of coal from both Witbank Colliery Limited and Van Dyks Drift Colliery decreased compared with the previous year. In the case of the former colliery, this was due to a severe shortage of non-European labour at Wolvekrans, where additional mechanized equipment has been installed and more is to follow, and in the case of the latter to a shortage of railway trucks. The Group has now acquired a further Colliery interest through the purchase by Welgedacht Exploration Company Limited of the Utrecht Colliery in Natal.

**Industrial:** The demand for cement in the Union slackened off somewhat at the beginning of 1957, but since then has taken an upward turn. The additional plant being installed by the Pretoria Portland Cement Company Limited at its Slurry works will be completed during the current year. Increases in the cost of new equipment continue to bear heavily on the Cement Industry. So far, with the one exception, referred to in the Annual Report, increases in the controlled selling prices of cement have been determined by the Authorities solely on

the considerations of profits per unit—a method which, of course, fails under the present circumstances to provide adequate compensation for the cost of replacements and extensions.

The demand for lime continued to increase, particularly so in respect of the requirements of the Uranium Industry.

Since the close of the last financial year of the Hume Pipe Company (S.A.) Limited there has been a decline in the demand for the products of that Company's factories situated at the Cape.

### DIRECTORS

After the close of the financial year Brigadier R. S. G. Stokes and Mr. W. D. Wilson resigned their seats on the Board and Mr. S. D. H. Pollen and Mr. W. Marshall Clark were appointed to the Board to fill the vacancies. As Shareholders will be aware, Brigadier Stokes had been a Director of the Company since 1936, and on behalf of the Board and the Shareholders I should like to thank him particularly for the long and valuable services he rendered to the Company.

As an item of Special Business you will be asked to pass a resolution amending the Articles of Association whereby the maximum number of Directors permitted will be increased from 12 to 15. In the event of your passing this resolution Lord Baillieu and Mr. B. G. Twycross will, as announced on March 19, 1958, be asked to join the Board.

## EAST RAND PROPRIETARY MINES, LIMITED

(Incorporated in the Union of South Africa)

The Sixty-second Ordinary General Meeting of Shareholders will be held in Johannesburg on May 27, 1958. The following is an extract from the circulated statement by the Chairman, **Mr. P. H. Anderson**, dated May 20, 1958.

### WORKING RESULTS

The tonnage of ore milled during the year at 2,634,000 was 86,000 tons higher than that for the previous year. Although the average yield at 5.115 dwt. per ton was 0.077 dwt. lower, the gold recovered increased by 12,170 ounces to 673,664 ounces. There was a slight reduction in the amount per ounce received from the sales of gold and the working revenue at £8,470,000 was £147,535 higher than in the previous year. Working costs increased by £480,230 due principally to higher labour charges and an increase in the costs of stores and materials, and the working profit at £1,840,833 was lower by £332,695 than for the year ended December 31, 1956.

### ACCOUNTS

To the working profit of £1,840,833 was added an amount of £99,136, being the excess of sundry income over expenditure, giving a total profit of £1,939,969. After allowing for taxation amounting to £510,131, there remained a sum of



£1,429,838 to be added to the unappropriated balance of £1,165,794 brought forward from 1956, giving a total of £2,595,632. From this amount £474,880 was transferred to Capital Reserve in respect of expenditure on Mining Assets and Trade Investments and £891,000 was paid in dividends, leaving a balance to be carried forward in the Income and Expenditure Account of £1,229,752.

#### DEVELOPMENT

The footage developed at 43,455 represented a decrease of 10,131 feet as compared with the previous year. The footage sampled at 11,570 feet was also less by 6,710 feet. The main reasons for this latter decrease were the completion of the reef drives on the 63rd and 64th levels between "D" sub-incline shaft and "M" pilot winze and the decrease in operations on the main reef horizon in the upper levels of the mine. Of the footage sampled 6,050 feet or 52.3 per cent was payable, averaging 13.3 dwt. over a channel width of 31 inches, equal to 413 inch dwt. As compared with the previous year, these results represent an increase of 7.4 per cent in the percentage payable and a decrease of 43 inch dwt. in the value.

The payable ore developed amounted to 1,257,600 tons of an average value of 6.9 dwt. per ton. This was 213,400 tons more and 1.4 dwt. per ton less than in the previous year.

#### ORE RESERVE

The available ore reserve at the year-end totalled 3,974,000 tons or 196,000 tons less than a year earlier. At 6.9 dwt. and 45.0 inches the average value and width thereof were 0.1 dwt. and 0.2 inch lower.

#### PROGRESS IN ESTABLISHMENT OF ULTRA DEEP AREA

Development and exploitation in the lowest areas of the mine are proceeding satisfactorily.

During the year preparations were made for the installation of the permanent man hoist in the Central Sub-Vertical Shaft. The rock hoist in this shaft is already in commission.

The permanent winders and equipment have been installed and commissioned at the South East Vertical Shaft and work is proceeding on the surface layout.

It has been decided to deepen the Far East Ventilation Shaft System by about 1,600 feet to 9,600 feet and to equip the two shafts to hoist men and material. It is expected that the sub-vertical portion of this system will intersect the reef horizon at a depth of about 9,500 feet. The sinking of the vertical portion of the shaft system was completed during the year to a final depth of 5,099 feet. At April 30, 1958, the sub-vertical portion of this system had reached a depth of 319 feet below the collar.

Work continued on the sinking of the sub-incline shafts and a further 1,483 feet of sinking was accomplished during the year, mainly in the "K" and "L" sub-incline shafts.

Below the 58th level, 3,220 feet were sampled in the pilot winzes during the year, and 63 per cent proved payable at an average value of 423 inch dwt. These results added to the results obtained previously in these winzes gave a total of 24,710 feet sampled, of which 70 per cent has proved payable at an average of 535 inch dwt. As will be seen on the plan that is available to Shareholders, the two deepest winzes were advanced to

vertical depths below surface of over 10,000 feet, "H" winze having reached a depth of 10,775 feet at December 31, 1957. On the 70th level, which is being driven on approximately the 9,700-foot horizon, 3,150 feet were sampled during the year, of which 72 per cent was payable at an average value of 477 inch dwt. A total of 6,900 feet has been sampled on this level, of which 4,880 feet were payable at an average value of 487 inch dwt. These satisfactory results continue to lend encouragement to the long-term programme that has been planned to develop the ultra-deep area of the mine, where development information indicates a continuation of favourable values in a south-easterly direction. Such a large-scale project must of necessity demand heavy capital expenditure, while working costs must inevitably increase with greater depths. In the light of the most up-to-date information, therefore, special consideration is at present being given to the long-term programme at the mine with particular reference to the amount of capital expenditure involved. As stated in the Report of the Directors, sections of the reduction plants are becoming obsolete and costly to maintain, and this matter is being considered by your Board as part of the overall programme.

#### DIRECTORATE

Owing to his imminent retirement, Mr. W. M. Frames relinquished the Chairmanship of your Company on March 17, 1958, but retains his seat on the Board of Directors. Mr. Frames has been Chairman since June 12, 1953, and I should like to place on record, in my capacity as his successor, my appreciation of his guidance of the Company's affairs and of his sound judgment throughout his period of office.

### TRANSVAAL CONSOLIDATED LAND AND EXPLORATION COMPANY, LIMITED

(Incorporated in the Union of South Africa)

The Sixty-third Ordinary General Meeting of Shareholders will be held in Johannesburg on May 27, 1958. The following is an extract from the circulated statement by the Chairman, Mr. T. Reekie, dated May 20, 1958.

#### ACCOUNTS

The profit before taxation amounted to £316,986, which was £55,038 lower than for 1956; due mainly to an increase of £57,315 in depreciation of shareholdings. The net provision for taxation absorbed £90,348. Dividends declared in 1957, which were increased from 3s. to 3s. 6d. per share, totalled £162,792 compared with £139,536 for the previous year. The net cash position of the Company decreased from £585,716 at the end of 1956 to £558,659 at December 31, 1957.

#### VAN DYKS DRIFT COLLIERY

Operations continued satisfactorily at the Colliery, but output was affected by a shortage in the supply of railway trucks and the coal despatched decreased by 5,947 tons to 679,445 tons compared with the output for the previous year. The working profit at the Colliery amounted to £185,379, which was lower by £17,917 than the figure for 1956. This decrease was due to a slight decline in working revenue and to an increase in working expenditure, mainly in the cost of stores and materials.

The sales output for the first four months of the current financial year was 227,283 tons, which is 3,779 tons lower than the output for the same period in 1957. The Colliery is adequately equipped to handle any likely demand for increased output.

#### SUBSIDIARY COMPANIES

The Company maintained its interest in Winterveld (T.C.L.) Chrome Mines (Proprietary) Limited and in September, 1957, it acquired the entire share capital of Rooderand Chrome Mine (Proprietary) Limited, which is mining chrome ore on the farm Rooderand No. 399 in the Rustenburg district, Transvaal. A satisfactory tonnage of chrome ore was produced and sold from both of these properties during the year.

#### MINERAL INTERESTS

The Company continues to hold a 45 per cent interest in the Platinum Prospecting Company (Proprietary) Limited, whose Brakspruit property is on a care-taking basis.

Royalties from certain of the Company's properties let on tribute for the mining of asbestos, chrome, and tin totalled £117,662 compared with £129,361 in the previous year.

#### INVESTMENTS

The list of the Company's principal investments was extended by the inclusion during 1957 of shareholdings in Free State Saaiplaas Gold Mining Company Limited, Rand Mines Limited, Rooderand Chrome Mine (Proprietary) Limited, and West Driefontein Gold Mining Company Limited. After allowing for these and other transactions together with depreciation, the book valuation of investments that are quoted on the Stock Exchange increased by a net amount of £85,700 to £549,874; the book value of holdings in subsidiary Companies increased by £41,027, while unquoted shares decreased by £42,971. The market value of quoted investments at December 31, 1957, viz.: £810,690, was £152,150 higher than the value at the end of 1956. Dividends accrued during the year totalled £64,796 compared with £47,932 for the previous year.

### CROWN MINES, LIMITED

(Incorporated in the Union of South Africa)

The Sixty-second Ordinary General Meeting of Shareholders will be held in Johannesburg on May 27, 1958. The following is an extract from the circulated statement by the Chairman, Mr. P. H. Anderson, dated May 20, 1958.

#### WORKING RESULTS

As a result of the large-scale reorganization of operations carried out early in 1957, the ore milled was some 16 per cent less than in 1956. During the first four months of the year, when the reorganization was taking place, losses were incurred, but thereafter the mine was re-established on a profit-earning basis. Due mainly to a lower yield, revenue fell by 1s. 8d. per ton milled, but in spite of the reduced tonnage milled working costs were lower by 10d. per ton. The combined influence of the above factors resulted in a decrease of working profit from £228,986 in 1956 to £72,676 in 1957.

#### ACCOUNTS

To the working profit was added a credit adjustment of £87,168 in respect of pneumoconiosis liabilities, interest re-

ceived amounting to £39,084 and £19,451 being the difference between sundry items detailed in the Income and Expenditure Account, making a total profit for the year, before taxation, of £218,379. This, together with the unappropriated balance of £1,186,207 brought forward from the previous year, gave a total of £1,404,586, which was dealt with as follows:—

Dividends Nos. 112 and 113 of 1s. and 1s. 3d. per share respectively totalled	£212,189
Provision for taxation amounted to	19,238
making a total of	£231,427
Less: A retransfer to Capital Reserve in respect of re-alization of mining assets and trade investments	32,667
	£198,760
and leaving an unappropriated balance to be carried forward to the current year's accounts of	1,205,826
	£1,404,586

The unappropriated balance, together with Retiring Gratuities and Abnormal Costs Reserves, was represented by net current assets totalling £1,489,898 as detailed in the Balance Sheet.

#### DEVELOPMENT AND ORE RESERVE

In the absence of any further shaft sinking and with the major programme of development on the Main Reef Leader and South Reef already completed, the footages developed and sampled were materially lower than in 1956. There were no significant changes in percentage payability and values.

The payable ore developed increased slightly to 818,000 tons, but both the width and value were lower. In spite of the increase in the ore developed and the transfer of some 584,000 tons from shaft and safety pillars, the available reserve decreased by 860,000 tons to 4,365,000 tons, of an average value of 4.7 dwt. over 44.5 inches as compared with 4.3 dwt. and 48.7 inches at the end of the previous year.

#### CURRENT OPERATIONS

Normal mining operations are being confined mainly to the lower western portion of the mine supplemented by reclamation operations in the upper levels of the mine and shaft pillar extraction. The stopping of No. 14 Shaft pillar is proceeding and preparations are being made for the extraction of Nos. 12 and 16 Shaft pillars.

### DURBAN ROODEPOORT DEEP, LIMITED

(Incorporated in the Union of South Africa)

The Sixty-first Ordinary General Meeting of Shareholders will be held in Johannesburg on May 26, 1958. The following is an extract from the circulated statement by the Chairman, **Mr. T. Reekie**, dated May 19, 1958.

#### WORKING RESULTS

There was an increase of 4,000 tons in the ore milled at 2,192,000 tons, while the yield of 3.533 dwt. per ton was 0.069 dwt. higher. The average amount per ounce received by the Company for sales of gold decreased by 3d. per ounce fine

to 250s. 9d. Working revenue at £4,871,511 was greater by £102,083. However, due to an increase in working costs of £118,187, equal to 1s. per ton milled, from £4,112,504 to £4,230,691, the working profit decreased by £16,104 to £640,820 compared with the previous year.

#### ACCOUNTS

To the working profit of £640,820 was added £31,690 in respect of interest, £22,790 being an adjustment of the Outstanding Liabilities Trust Fund and £9,581 being the difference between sundry items detailed in the Income and Expenditure Account, resulting in a profit before taxation of £704,881. Taxation absorbed £144,136, leaving £560,745 to be added to the balance of Income and Expenditure Account at December 31, 1956, making a total of £1,365,394. Of this amount £348,750 was appropriated for two dividends of 1s. 6d. each per share and £99,645 was transferred to Capital Reserve in respect of expenditure on Mining Assets and Trade Investments, leaving a balance in the Income and Expenditure Account at December 31, 1957, of £916,999 to be carried forward to the current year. This balance, together with Reserves for Retiring Gratuities and Abnormal Costs, totalled £1,034,435, which was represented by net current assets as detailed in the Balance Sheet.

#### PNEUMOCONIOSIS

The levy charged during 1957 to owners of Controlled Mines of Group A, as defined in the Pneumoconiosis Act, 1956, was at the rate of £4,050,000 per annum. Early in 1958 the levy was re-determined and fixed at the rate of £2,835,000 per annum with retrospective effect from October 1, 1957. Even though allowance was made for the Company's proportion of the consequent rebate in respect of the final quarter of the year, the pneumoconiosis charges debited to working costs increased from £131,861, or 1s. 2d. per ton milled, to £149,597, or 1s. 4d. per ton milled.

#### DEVELOPMENT

The footage developed during the year at 76,154 feet increased by 9,455 feet compared with the previous year. Of this increase 7,115 feet was off reef in main haulages. The development on reef totalled 40,643 feet, which was slightly more than the figure for 1956. A total of 34,370 feet was sampled, of which 17,900 feet, or 52.1 per cent, was payable, the channel value being 8.0 dwt. per ton and the channel width 48 inches as compared with 8.6 dwt. per ton and 46 inches respectively for the previous year. Of the total of 34,370 feet sampled, 19,880 feet, or almost 58 per cent, was on Kimberley Reef. The percentage payability on Kimberley Reef, Main Reef Leader and Main Reef increased, particularly on Main Reef Leader, where it improved from 21.1 per cent to 40 per cent. The payable disclosures on South Reef, however, decreased from 49.8 per cent to 32.9 per cent and the channel value at 42.9 dwt. per ton was 7.4 dwt. per ton less. The payable ore developed at 1,049,000 tons was lower by 429,000 tons, the value remaining unchanged while the width was 1.7 inches less. Development on Main Reef was resumed on the 44th and 48th levels towards the Lease Area. Within the Lease Area a total of 2,537 feet was developed on the 39th and 40th levels of which 2,043 feet were on reef, 36.7 per cent being payable with an average value of 373 inch dwt.

#### ORE RESERVE

The available ore reserve recalculated at December 31, 1957, totalled 7,760,000 tons, or 472,000 tons less than at the end of the previous year. The decrease is accounted for largely by the extension of the long wall system of stoping at depth and to lower block widths. The value was unchanged at 4.0 dwt., while the estimated stoping width was 1.1 inches lower at 59.7 inches.

Compared with the figures at the end of 1956, there was a decrease of 668,000 tons in the available ore reserve on Main Reef and 32,000 tons on South Reef, while there were increases of 214,000 tons and 14,000 tons on Kimberley Reef and Main Reef Leader respectively.

#### SHAFT SINKING

All possible preparatory work for the deepening of No. 5A Sub-Vertical Shaft, including the installation of the hoists and the construction of the double-deck stage, was completed by the end of the year. Sinking was resumed on March 17, 1958, but was temporarily suspended on April 7 upon encountering broken ground which necessitated concreting. Sinking began again on April 29, 1958, and in all 35 feet had been sunk up to the end of April, 1958, to a depth of 3,107 feet below the collar or 43 feet below 45 Station. In No. 6A Sub-Vertical Shaft work was continued on the completion of the loading levels, ore passes and spillage winze, and on the installation of equipment. Nos. 8 and 9 Incline Shafts (Kimberley Reef) were sunk 191 feet and 1,146 feet during the year to depths of 2,695 feet and 4,017 feet below the collar respectively. By the end of April, 1958, No. 8 Incline had been sunk a further 154 feet to a point 2,849 feet below the collar, or 159 feet below 11 Station, and No. 9 Incline a further 438 feet to a depth of 4,455 feet below the collar, or 135 feet below 17 Station. No. 9 Incline has connected with the cross-cut from 17 Station, No. 6 Shaft.

### CITY DEEP, LIMITED

(Incorporated in the Union of South Africa)

The Fifty-seventh Ordinary General Meeting of Shareholders will be held in Johannesburg on May 27, 1958. The following is an extract from the circulated statement by the Chairman, **Mr. P. H. Anderson**, dated May 20, 1958.

#### WORKING RESULTS

During the year under review 1,780,000 tons of ore, giving an average yield of 3.909 dwt. per ton, were milled, and 347,907 ounces fine of gold were recovered. In the previous year the relative figures were 1,851,000 tons milled, with an average yield of 3.862 dwt. and a recovery of 357,427 ounces fine of gold. The working revenue for the year was lower by £122,898, but working costs decreased by £229,204, with the result that the working profit rose by £106,306 to £196,486.

#### ACCOUNTS

To the working profit of £196,486 was added £71,725, which represents the difference between sundry items of income and expenditure, giving a total profit of £268,211. The addition thereto of the unappropriated balance brought forward of £699,170 gave a total of £967,381, against which deductions total-



ling £186,925 were made in respect of taxation, two dividends and a transfer to Capital Reserve. This latter transfer of £74,125 to Capital Reserve was in respect of the net amount expended on Mining Assets less realization of Trade Investments. The resulting balance of the Income and Expenditure Account was £780,456, which carried forward to 1958. This unappropriated balance, together with revenue reserves totalling £223,123, was represented by current assets of £1,548,458, less liabilities and provisions amounting to £544,879.

#### OPERATIONS AT THE MINE

The South and Main Reef Leader Reefs continue to provide the main sources of ore, but on the former reef development was limited by the natural difficulties of opening up and equipping old areas in the upper sections of the mine. Development on the Main Reef Leader, which is being carried out almost entirely at great depth from a limited number of possible points of attack, was somewhat disappointing, but the relatively few exposures made are not necessarily representative of future possibilities. The ore developed at 598,000 tons was lower by 273,300 tons, but the value remained unchanged.

Last year it was stated that in view of the possibility that payable values may persist beyond the present southern boundary of the Company's mining property, the permission of the Government had been sought and received to prospect the area. The work done has justified an application for the renewal of the prospecting permit and also for an application for a mining lease over an area of approximately 313 claims in the prospecting area.

#### ORE RESERVE

The available ore reserve recalculated at the year-end at 3,302,000 tons was 448,000 tons lower than at the end of 1956. The average value and width decreased by 0.1 dwt. and 0.8 inch respectively.

#### CURTAILMENT OF OPERATIONS

Shareholders will recall that over the past two years reference has been made to the reorganization of the hoisting and pumping arrangements between the City and Nourse sections of the mine with the object of closing down certain high-cost Nourse shafts as soon as possible. With this plan in view, and as a precautionary measure, notice was given to the Government in July, 1956, of the Company's intention to curtail materially its operations by closing down the Eastern Section of the mine. Since that date operations have continued in this Section, but only on a marginal basis, and the stage has now been reached where losses will be incurred there and the mine as a whole will be endangered. In view of this serious position your Directors have agreed to the recommendation of the Company's technical advisers that operations in the upper portion of the Eastern or Nourse Section be curtailed from June 1, 1958, by confining work to reclamation and shaft pillar extraction. The Government has been advised of your Board's decision and an announcement to this effect was made in the Press on April 26, 1958.

Although it is anticipated that the rate of milling will be reduced to about 110,000 tons a month as a result of this reorganization, the balance of operations should be considerably improved, with beneficial effects on the profit position.

## THE STRAITS TRADING COMPANY LIMITED

### SIR EWEN FERGUSSON ON THE INTERNATIONAL TIN AGREEMENT

At the Annual General Meeting of The Straits Trading Co. Ltd. held in Singapore on May 14, 1958, the Chairman, Sir Ewen Fergusson, who presided, said:—

The Report and Accounts for the year ended December 31, 1957, having been in your hands for the prescribed time I shall with your permission take them as read.

The quantity of ore available to the Malayan Smelters during 1957 was very slightly greater than in 1956, a decline of 3,500 tons from the Federation being offset by an increase of 3,800 tons from Thailand. But in 1957 unrestricted production came to an end in the six producing countries signatory to the International Tin Agreement and it is inevitable that much less ore will be available during 1958.

At the October meeting of the International Tin Council it was announced that the Buffer Stock held 3,916 tons of tin as at June 30, thus confirming rumours that the market had been supported during the second quarter of the year. From April the price had been steadily declining, and during the last three months of the year the 3 months price broke through the Buffer Stock floor price, averaging £728 in October, £710 in November and £728 in December.

That the Buffer Stock continued to acquire cash tin in London at the floor price of £730 is true, but nevertheless by apparently looking on forward tin as something of less importance in maintaining the price there was a failure to hold the floor. The result was that considerable quantities of tin were bought by various persons and re-sold to the Buffer Stock at a handsome profit. This intermediary profit should not have arisen, and it is doubtful if the Buffer Stock avoided the acquisition of even one ton of metal by not supporting the 3 months price at the floor. Producers in Malaya and Thailand suffered accordingly.

#### Effect of U.S. Recession

During the latter half of the year it was becoming clear that the recession in the United States was having a depressing effect on world commodities and that the deflationary measures and currency crises in other countries were all adding to the difficulties of the tin situation. This had become critical by November and a special meeting of the International Tin Council was convened for December 4, 1957.

At this meeting drastic restriction of production was imposed to take effect from the 15th of that month, though the date was too near the end of the year to have any effect on the exports from the producing countries for 1957.

It was a fairly confident prediction that when American stockpiling ceased world production would be from 16,000/25,000 tons of tin a year in excess of consumption, though in the long term, consumption was tending to rise while production was contracting. These calculations were made in a period of active world trade, but even then the higher figure of 25,000 tons was looked on by many as the more likely measure of actual over-production.

Such a prediction leads to the conclusion that the maximum quantity of tin required from the signatory countries in the future will be about 130,000 tons per year during a period of active world

trade. In a period of recession less is likely to be required, but to restrict output by 25,000 tons means a cut in exports by the signatory countries of about 16% of their 1957 production. How will this affect Malaya?

Her percentage of world permitted export is 37.50% which, as a portion of 130,000 tons, amounts to 48,750 tons. The present domestic assessment is about 68,000 tons or, if 1,000 tons is deducted for dulong passes and sundries, about 67,000 tons for mining. One is thus able to deduce that on current assessments the export quota for mines is unlikely to exceed 72.75% for some time to come.

It must be pointed out however that there is a measure of unreality in that percentage. It is highly doubtful if Malaya, working all out, could ever produce 68,000 tons tin and a realistic estimate of maximum production may be taken as 60,000 tons.

#### Malaya's Assessment Too High?

The excess of assessments over true ability to produce, with its conferment of export rights on non-existent production, is an artificiality which at 12% over full production seems too high to be perpetuated. As long as the excess lasts however, the export quotas it creates represent a cash value to some constituents of the mining industry at the expense of others. To sort it out and make adjustments will take time.

The introduction of export control was smoothly carried out and the highest praise must be accorded to the Mines Department and to the voluntary Committees for the speed with which their preparations were made at such short notice. Inequalities and anomalies were no doubt inevitable at the outset and no one will envy them their tasks of investigating and deciding upon the numerous appeals and complaints which are bound to be made.

#### Thailand's Assessment

The steady increase in production in Thailand was again noteworthy and it is pleasant to record that our close neighbour was rightly able to obtain an increase to 8.35% in her percentage under the Tin Agreement. From her original percentage of 6.29% this represents an increase of 2.06% or a recognition that their domestic production had increased by nearly 33% per cent since the Agreement was negotiated.

One new aspect of the Tin Scheme deserves mention and that is the authority which has been granted by the Tin Council to the Buffer Stock Manager to sell metal in the middle range, that is between £780 and £830 per ton. So far the authority is restricted to short periods coinciding with the calendar quarters for which export quotas have been fixed. The present authorization extends to September 30 this year.

This is a safeguard to consumers in case a sudden shortage in supplies should develop, but it also ensures that the Buffer Stock Manager will have an opportunity, for liquidity reasons, to convert some of his holdings into cash at a lower price than is provided for in the scheme. It is most likely that drastic restriction of output will continue until that objective is achieved. At the present time permitted exports are at a rate of only 92,000 tons metal per year, though this heavy cut is being made less effective



by the sales in Europe and Japan of what is apparently Russian cum Chinese tin.

When opportunity arises for disposal of stocks under these special short term measures it is to be hoped that this time, in the particular interest of producers in this part of the world, due attention will be paid to the 3 months price on which so much of the world trade in tin is based.

#### The Accounts

Turning to the accounts it will be noted that the earnings show a slight increase over the previous year due in large part to dividends received from tin-mining companies. This has enabled us to maintain the distribution at approximately the same as last year. Earnings this year are likely to be affected by the severe cut in tin ore production which will also have repercussions on the dividends from our investments.

The Balance Sheet reflects the changes in the Capital structure which were passed at the Extraordinary General Meeting last year and Issued Capital is now \$12,000,000 in 1,200,000 stock units of \$10 each. Reserves are increased by the transfer of \$500,000 made last year and will be further augmented by the passing of the Resolutions at today's meeting.

One stockholder has queried the need for this transfer but as we have explained in the past, this is a prudent procedure fully justified by the wasting nature of so many of the investments, including those in Subsidiaries.

Sundry Creditors and Credit Balances show an increase over the previous year whereas Bank overdrafts show a reduction. Both are affected by the amounts outstanding for ore purchased but not settled, and there was an acceleration of ore deliveries from mines during December so that production could be exported before the introduction of export control and also before the re-imposition of Buffer Stock contributions on January 1, 1958.

Works, Land, Buildings and Furniture continue to be conservatively valued, the main item of expenditure being the block of flats at Federal Hill, Kuala Lumpur.

The total figure under Subsidiary Companies shows an increase which is very largely represented by cash. An internal adjustment has been made between amounts due by Subsidiaries and Investments in Subsidiaries, a course which was decided upon as the best method of taking care of the closing down of the two mines where results proved to be so far below expectations.

Sundry Investments show a reduction due to capital refunds from various companies. As in the past we are able to report that the market value is in excess of the book value, and we hope that this may long continue. We do not consider it in the best interests of the Company to publish periodical valuations.

Tin and Tin Ore in Stock and in Transit is a conservatively valued item after allowing for smelting, treatment and contingencies.

Fuel and Stores Stocks are higher due to the increased cost of most items used in our business. Sundry Debtors and Cash in Hand call for no special comment.

We have now closed down two of our mines, Karak for the reasons given when I last addressed you, and Laboo after it became clear that the underground ex-

ploration and development did not disclose the second continuous ore body which was inferred from the diamond drilling carried out before the War.

#### Joint Operation

The joint operation of the Jinjang area with The Renong Tin Dredging Company Limited again produced satisfactory results though they must inevitably be affected by the current heavy restriction. The venture in Tanganyika has still not reached the operating stage but with all plant now on the site this should not be long delayed.

The British Tin Smelting plant in England had another difficult year and there has been no change in the supply position of suitable residues for treatment. However, operations are continuing and the plant has been kept in good condition and ready to treat increased supplies should they become available.

Pelam Estate had another satisfactory year and it is a venture of which we may well be proud. The extra land which we needed for development and to keep a large block of high grade rubber always in tapping has now been alienated. The first 500 acres are being prepared for planting and excellent progress is being made. Improvements are also under way in the factory and we have every hope of maintaining Pelam as one of the most efficient units in Malaya.

As always we have been well served

by our Staff on the mines, on the rubber estate and throughout our smelting organization. It gives me great pleasure to commend them to you and I am certain you will endorse the tribute which I pay to their help and to their loyalty.

Before closing this Address I must also refer to valued colleagues whose services with the Company have ended or are ending, because of retirement. Mr. G. C. Wilson joined us in 1925, Mr. E. F. Evans in 1926, Mr. R. W. Brown and Mr. T. G. Scott in 1927 and Mr. W. Rodger in 1928. Mr. Brown and Mr. Rodger became Directors of the Company in 1954.

All of them have more than thirty years service and, with the exception of one who was fortunately on leave, all suffered imprisonment at the hands of the Japanese, in Japan, Siam, or in Singapore. They are almost the last of the pre-war brigade, and without them and their experience and great sense of duty to help re-establish this Company, and in turn to pass on their knowledge to a younger generation, we could not be in the position we are today. We have much to thank them for and I am sure you will wish to be associated in wishing them much happiness and long years of well-deserved healthful leisure wherever they may settle.

The Report and Accounts were adopted and Mr. Tan Chin Tuan, C.B.E., was re-elected a Director of the Company.

## THE VEREENIGING ESTATES, LIMITED

(Incorporated in the Union of South Africa)

### CONTINUED RISE IN DEMAND FOR COAL

The following extracts are from the statement by **Mr. T. Coulter**, the chairman, which has been circulated with the annual report and accounts.

#### Accounts

The net profit amounted to £1,139,370 (£1,024,679). Adding the balance of unappropriated profit amounting to £245,077 (£214,148) brought forward from the previous year, the total to be dealt with was £1,384,447 (£1,238,827). Appropriations comprised £100,000 (£100,000) to general reserve while dividends for 1957 at 7s. 6d. per stock unit absorbed £1,031,250 (6s. 6d.—£893,750), leaving an unappropriated balance of £253,197 (£245,077) to be carried forward.

The total distribution for the year was 7s. 6d. per stock unit which is 1s. higher than the distribution made in respect of the previous year.

Current assets amount to £1,645,818 and exceed current liabilities by £877,217 as compared with an excess of £1,070,093 at the end of the previous year. Liabilities have increased as a result of the higher final dividend due to stockholders and payable on March 22, 1958.

Production of coal for 1957 by collieries of the Union of South Africa amounted to 37,686,528 sales tons, an increase of 2,116,710 tons compared with 1956. Of this tonnage the subsidiary and associated colliery companies of The Vereeniging Estates, Limited contributed 12,778,188 tons in 1957, as compared with 12,701,857 tons in 1956.

The inland demand for coal continues to rise and while the South African Railways are handling larger tonnages of coal each year, increasing tonnages are also being carried by road due to shortage of railway transport.

During the year under review over 3,000,000 tons of coal had to be hauled by road.

#### Labour Shortage

Considerable difficulties were experienced at most collieries in the Union, due to seasonal shortage of native labour, which was rather more acute during the past year than in former years.

In an effort to meet this situation, the coal industry as a whole is being forced to investigate the merits of mechanization or partial mechanization and thus reduce the complement of natives required for a given output of coal. Any mechanization project will of course involve rather heavy capital outlay which, in the case of operating collieries, must be met by appropriations from current profits. Full mechanization where it can be adopted is an expensive undertaking.

The controlled price of coal at the pit-mouth has remained unchanged since November, 1956, at an average of the order of 10s. 9d. per ton.

Recent increases in working costs have more than absorbed the benefits of the previous increase and this, together with the need to accumulate funds for improvements and mechanization, has clearly demonstrated the necessity for an increase in the controlled price of coal.

#### Transvaal Coal Corporation

Stockholders will recollect that in 1951 the company acquired the total shareholding of Transvaal Coal Corporation Limited, from which date it became a subsidiary company. The corporation possesses valuable coal reserves in the Witbank area and obtains its revenue through royalties from, and dividend in-

come from its shareholding in, Blesbok Colliery Limited. The coal reserves of the farms over which the corporation has the rights have been proved by a thorough drilling programme and are adequate for the requirements of more than one colliery. The corporation possesses no financial resources of any consequence other than the income already mentioned, and in the exploitation of its reserves finances would have to be provided by the shareholder or shareholders. During 1957, the Electricity Supply Commission invited tenders from a number of interested parties for the supply of coal under long-term contract for a new power station to be erected in the Eastern Transvaal. The successful tenderers were Federale Mynboumaatskappy Beperk who own coal rights immediately adjoining some of the rights held by the corporation. At the invitation of Federale Mynboumaatskappy Beperk the corporation has agreed to lease a portion of its coal rights on a royalty basis and also to provide 35 per cent. of the share capital and loan capital necessary for the establishment of a colliery to be operated

by the newly-formed company, Blinkpan Koolmyne Beperk.

The corporation's liability under this agreement amounts to the provision of capital of the order of approximately £615,000 all of which would have had to be found by your company. With a view to spreading this burden and at the same time widening the field of your company's interests in the coal industry, an arrangement was concluded whereby African and European Investment Company Limited purchased half the share capital in the corporation and your company at the same time acquired a substantial interest in Blesbok Colliery Limited and Natal Coal Exploration Company Limited.

Natal Coal Exploration Company Limited, which is one of the largest Natal colliery companies, is situated in the Newcastle district and produces approximately 750,000 sales tons annually. Its dividend rate for the year ended June 30, 1957, was 9d. per 5s. share.

Your company has now a direct holding for the first time in a Natal colliery enterprise.

## Book Reviews

**British Coal Mining Explosives**, by James Taylor, M.B.E., D.Sc., and P. F. Gay, Ph.D. Published at 27s. 6d. by George Newnes Ltd., London. 167 pp. 38 diagrams and 10 halftone plates.

Here at last is an authoritative and up-to-date textbook which, within a comparatively small space, adequately covers the basic principles of colliery explosive practice. When one considers that upwards of 100,000,000 shots are fired annually in British collieries, it is strange that so few textbooks dealing solely with explosives have been written. A definite need did exist and has now been filled.

The authors have been concerned with the manufacture and use of explosives for some thirty years, and have drawn on this experience to produce a work which is characterized by an appreciation of what a mining engineer should know about explosives.

In the early chapters of the book, the authors deal competently with the history of coal mining in Great Britain and the development of early explosives. Subsequently, all the principal types of British coal mining explosives are treated in some detail from both the chemical and physical standpoint; the chapters dealing with the blasting of rock and coal are particularly useful. There are sections on modern detonators—delay and instantaneous—in which the construction, characteristics, testing procedure, and application are fully covered. Alternatives to blasting are given consideration and such devices as Cardox, Hydrox and Airdox are discussed in detail, together with pulsed infusion blasting.

Other useful information given in the book concerns explosive testing procedure in Britain and many other countries and a chapter is devoted to the law in relation to explosives, dealing with storage, transport, and use. A complete chapter has been given over to open cast coal mining, and discusses the special blasting problems of open pit mining.

Although the book is small, the subject has been adequately covered, and for those readers desiring more detail each of the fourteen chapters is followed by

a comprehensive list of references. Written primarily for coal mining men, nevertheless much of the treatment is necessarily general and will be of interest and use to the metalliferous miner.

An informative and readable book.

**Lehrbuch der Bergbaukunde, Vol. II**, by Prof. H. C. Fritsche. Published by Springer-Verlag, Berlin (German text). Price 34 marks (56s. 8d.). 600 pp. and 550 illustrations.

Professor Fritsche's textbook of mining engineering has for decades been a standard work in Germany. Recently revised and including whole new chapters, *Lehrbuch der Bergbaukunde* treats in two volumes the entire field of mining with special reference to colliery practice. Written as much for the technical college student as for the university student, the book is a result of the author's long experience in both the practical and academic fields of mining.

Volume II has six chapters and covers shaft sinking and opening out underground; methods of working (including metalliferous mining practice); treatment and measurement of rock movement and rock pressure; supports; mine drainage and fires, and rescue work.

Throughout the book particular attention has been paid to the economic factors having a bearing on the various aspects of mining, and in this connection the practising mining engineer will find the work of great value.

A publication of the British Electrical Development Association, *Induction and Dielectric Heating*, is designed to assist in the selection of the most suitable applications of electrical heating in industry. Further information may be obtained from the British Electrical Development Association, 2 Savoy Hill, London, W.C.2.

The economic development in the Canadian prairies generally, and the position which Saskatchewan, in particular, fills as geographical centre of the region, is dealt with in the booklet,

## BRITISH ROPES

### SALES MAINTAINED

The thirty-sixth annual general meeting of British Ropes, Ltd., was held on May 21 in London.

Mr. Herbert Smith (chairman) in the course of his speech said:

I would refer first to the very satisfactory result of the year's trading, and the strong position disclosed by the balance sheet. The group trading profit before taxation amounts to £2,566,000 compared with £2,369,000 for the previous year, an increase of £197,000. Taxation again absorbs more than half of the profit. Your directors recommend a final dividend of 13 per cent on the Ordinary stock, making a total of 17 per cent for the year.

Trading conditions have tended to be rather more difficult than in recent years, but the three main sections of the company—Wire, Wire Rope and Hard Fibre—have attained a sales level in both tonnage and value which is very similar to the previous year. More than 20 per cent of our production in the United Kingdom was exported; this represents an important part of our business. Intense competition has been met in many of these markets, but in spite of this we have increased our overseas trade.

During the last few months of 1957 the demand for wire rope and fibre rope for the Shipping industry fell below the normal level. Otherwise during the year the demand has reached the expected level. The future, however, is not so certain, and in 1958 we may not attain the profits shown for 1957.

The report was adopted.

### Book Reviews—continued

**Saskatchewan, Centre of the Prairie Market**, published by the Saskatchewan Industrial Development Office, and obtainable from Graham Spry, Agent-General, 28 Chester Street, Belgrave Square, London. A further booklet, tracing the growth of industry in Saskatchewan, entitled *Saskatchewan Turns to Industry*, is obtainable from the same address.

The second of a series of four maps showing the results of an airborne magnetometer and scintillograph survey made by the Bureau of Mineral Resources in the Tennant Creek area has been made available on and after April 21, 1958. The first map covered an area of about 500 sq. miles around the Tennant Creek township and was published last October; the second covers an area of 500 sq. miles to the immediate north, designated as the Mount Woodcock area. In the Tennant Creek field, gold and copper commonly occur in association with bodies of quartz-hematite-magnetite, which are strongly magnetic, and the primary object of the 2,000 sq. mile survey was to detect, by means of the airborne magnetometer, concealed bodies of this type. The maps, detailing the results, will be of considerable assistance to mining companies and prospectors engaged in the exploitation of gold and copper mineralization. Copies of the maps will be obtainable from the offices of the Bureau of Mineral Resources in Melbourne, Canberra, and Darwin, the Mines Branch in Darwin, the Atomic Energy Commission in Sydney, and at the Mining Registrars' offices in Alice Springs and Tennant Creek.



## Man...and Machine

Though Kenya possesses a fast-developing modern mining industry, it is still possible to see ores being won from the earth by the old traditional methods. For successful business dealings the Westerner needs to know something of both these sides of life in Kenya. Here he will do well to consult the **National Overseas and Grindlays Bank Limited**—a recent amalgamation between the National Bank of India and Grindlays Bank. The bank not only provides an efficient modern banking service, but has also a fund of knowledge of all kinds concerning East Africa and Northern and Southern Rhodesia, as well as India and Pakistan.

## NATIONAL OVERSEAS AND GRINDLAYS BANK LIMITED

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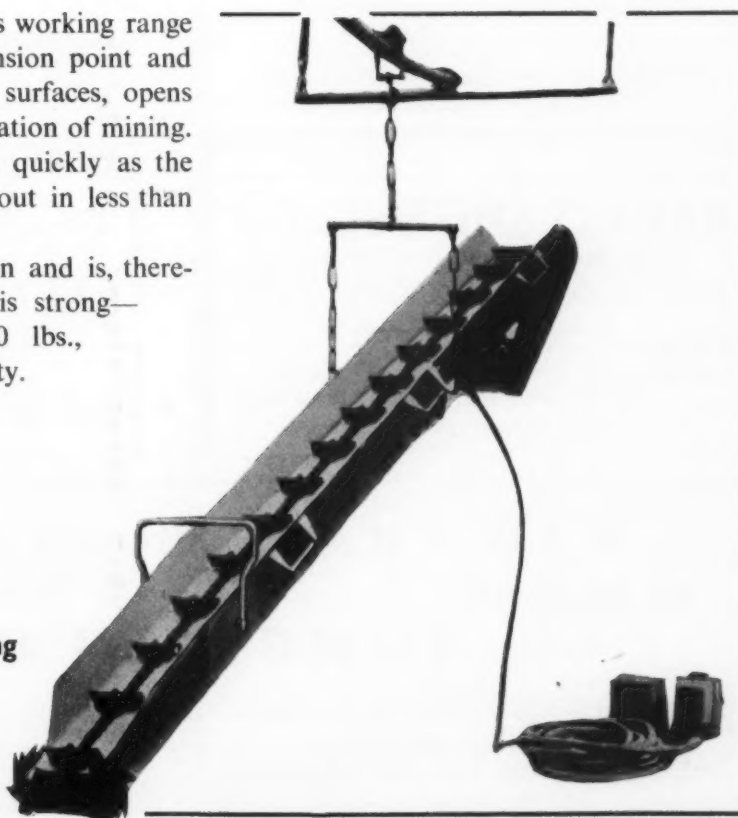
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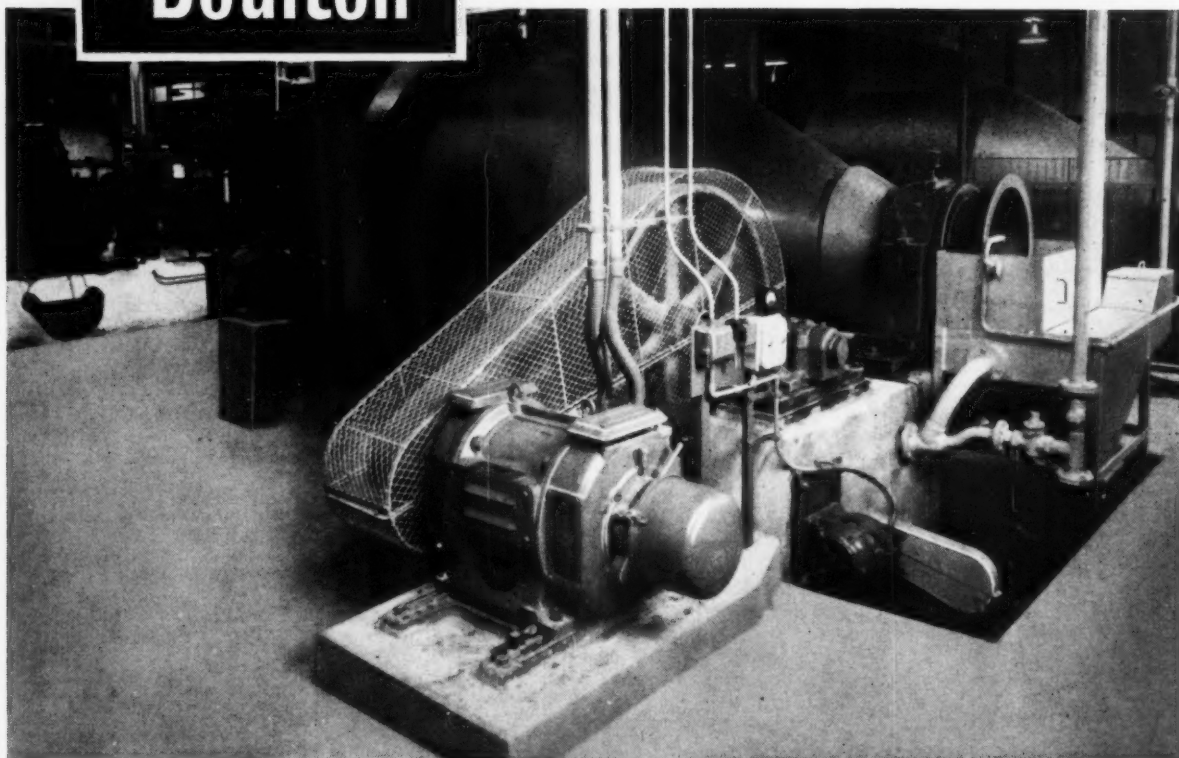


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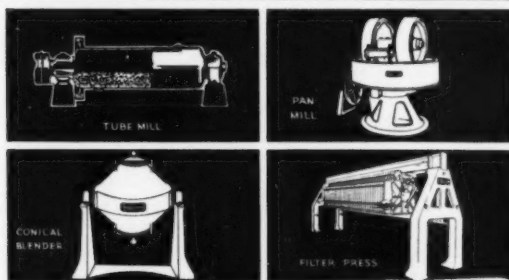
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